THE ATOM

Los Alamos Scientific Laboratory

July, 1967

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THE ATOM

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Editor: Virginia S. Lees
Photography: Bill Jack Rodgers
Contributors: Members of the Public Relations staff

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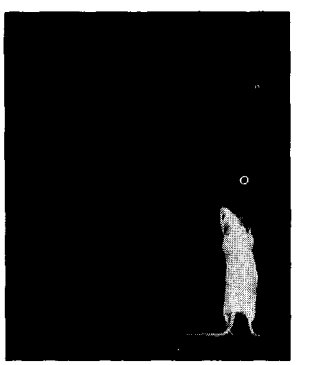


COVER:

Photographing one mouse is more difficult than photographing hundreds, PUB photographer Bill Jack Rodgers discovered. After several sessions with some less-than-cooperative models, he finally had a special plastic cage built in a size proportional to The ATOM cover, inserted the mouse and waited for it to perform. (Story begins on page 17.)

short subjects

Robert I. Howes, Jr., son of Mr. and Mrs. Robert Howes of Los Alamos, recently received his doctor of dental surgery degree from Columbia University. Howes came to Los Alamos with his parents in April, 1943, and received nearly all his early education in Los Alamos schools. He graduated from Amherst College in 1963 with a B.A. in biology, working at LASL as a summer employe in 1960, 1961 and 1962. As a graduate student, he was employed in H division during the summers of 1963, 1964 and 1965. Howes has been granted a National Institutes of Health fellowship to do post-doctoral research at Columbia. His wife, Ruth, recently received her M.S. degree in physics and is continuing to work toward her Ph.D. Howes' father is assistant Shops Department head.

Wright H. Langham, assistant health division leader for bio-medical research, has been named national president-elect of the Health Physics Society.

Also as a result of his work in health physics and related fields—especially manned space flight—he has written a book to be published this month, titled "Radiobiological Factors in Manned Space Flight." It is published by the National Academy of Sciences.

Langham helped organize the Health Physics Society in 1955. Today the organization counts nearly 3,000 members scattered throughout the world. Major goals of the organization are to aid and advance health physics research, to disseminate information between individuals in the field, to improve public understanding of problems and needs in radiation protection and to develop programs for the training of health physicists.

Langham was chosen president-elect during the society's annual meeting last month and will take office next June.

Langham's interest in health physics dates back many years, and he has been a member of many groups specializing in problems of toxicology, biophysics and radiobiology. His work has led him into such fields as the physiology and toxicology of plutonium, tritium and other radioactive materials; effects of massive doses of radiation on animals; potential hazards of worldwide radioactive fallout from nuclear weapons tests; uses of radioisotopes in biology and medicine and radiation problems associated with space conquest.

Langham said the book considers the potential hazards to man resulting from exposure to natural space radiation environment during flights lasting up to three years. "It is focused more on the success of the missions and the amounts of radiation that man can withstand rather than on maximum protection of the individual," he said.

Glen A. Graves, N-2, has been elected to the office of chairman of the aerospace division, American Nuclear Society. Graves, a member of the aerospace division executive committee from 1963 to 1966, served as vice chairman of the division last year. He is also currently vice-chairman of the Trinity Section of ANS. A staff member with LASL since August, 1952, Graves has been strongly involved in the Rover program since its inception 12 years ago and now works primarily in radiation analysis studies and reactor physics. He received his A.B., M.S. and Ph.D. degrees in nuclear physics from Indiana University, Bloomington.

William H. Chambers, alternate W-7 group leader, will spend approximately one year as the LASL representative on the AEC Combined Operations Planning (AECOP) team at Oak Ridge, Tenn.

While at AECOP, Chambers will remain a LASL employe and W-7 alternate group leader.

AECOP is a new organization established to assist the AEC in analyzing and planning the operations of its production facilities and resources. Its mission is to study the operational planning now being done by the individual elements within the AEC.

Warren E. Nyer, a former LASL employe, has been named vice chairman of the Atomic Safety and Licensing Board Panel of the Atomic Energy Commission. He was with the Los Alamos Scientific Laboratory in 1945 and 1946 and again from 1947 to 1951, when he joined the atomic energy division of Phillips Petroleum Co. Earlier this year he became associated with Aerojet General Corp.

more short subjects. . .

Nine patents by Los Alamos Scientific Laboratory employes and one former LASL employe are among 165 held by the Atomic Energy Commission which have recently been made available for public use. The patents were issued during the period August through December, 1966.

Included are "Radiation Reactor" by L. D. P. King, Director's Office; "High Q Power Capacitor" by J. A. Phillips and A. E. Schofield, P-14; "Wide Angle Optical System Having a Telecentric Stop and an Interference Filter" by B. B. Brixner, GMX-9; "Method of Preparing Plutonium Mononitride" by J. A. Leary and R. L. Nance, CMB-11; "Thermal Expansion Impulse Actuator in Plasma Jet Apparatus" by I. Henins and J. Marshall, Jr., P-17; "Method for Producing Ultra High Purity Plutonium Metal" by J. A. Leary and L. J. Mullins, Jr., CMB-11; "Ultra-high Purity Carbide Formation" by R. E. Riley and K. V. Davidson, CMB-6; "Low Inductance Capacitor and Switching Assembly" by R. S. Dike and E. L. Kemp, P-16; and "Carbide Deposition on Tantalum" by J. C. McGuire, former LASL staffer now at Richland, Wash.

The AEC has now released 3955 Commission-held U.S. patents and patent applications for licensing.

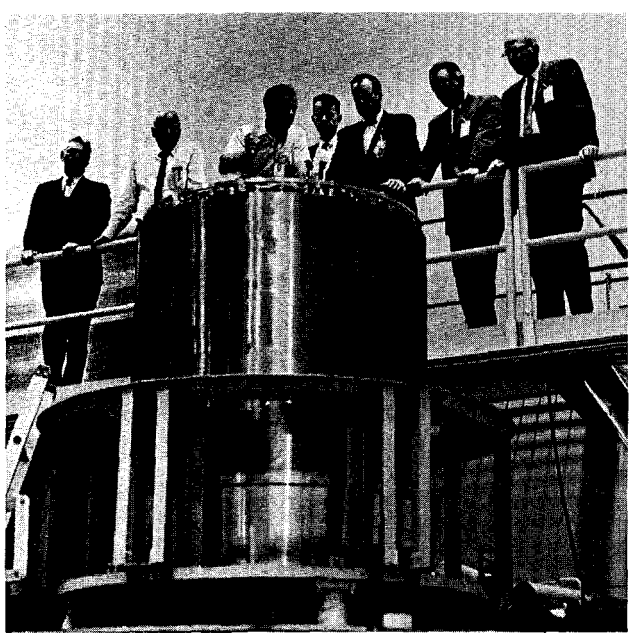
John J. Burke, former manager of the Los Alamos Area Office of the Atomic Energy Commission, has been named special assistant to the AEC's assistant general manager for operations at AEC headquarters, Germantown, Md. Burke joined the Los Alamos office in 1953, was named deputy area manager in 1955 and area manager in 1960.

Brig. Gen. David V. Miller, who was assigned to the Los Alamos Scientific Laboratory as a nuclear research officer in 1953 and 1954, assumed command of the Air Force Special Weapons Center at Kirtland Air Force Base, Albuquerque, on July 1. He replaces Col. Ralph S. Garman who will retire later this year.

Gen. Miller was most recently vice commander of the Air Force Space Systems Division in Los Angeles. He has spent most of his 26-year military career in science and engineering, including duty at LASL from March, 1953, to July, 1954. He holds a master's degree in physics from the University of Wisconsin. From 1958 to 1963, he served as the Air Force's Special Assistant for Nuclear Development, and then as Deputy Director of Air Force Research and Technology. He was a member of the Military Liaison Committee to the Atomic Energy Commission for four years during this period.

George S. Challis, 54, head of Los Alamos Scientific Laboratory's personnel services department from December, 1945, until June, 1949, died May 28 after a long illness at his home in Lodi, Calif.

Formerly a San Francisco Bay area newspaperman, Challis left wartime Navy service to come to Los Alamos where he founded and edited the first weekly newspaper, The Los Alamos Times. He also directed radio station KRS and supervised the installation of the present Mail and Records department. He was a prime organizer of the Community Concert Series. After leaving Los Alamos, he became advertising manager of the La Grande, Oregon, Daily Observer. At the time of his death he was managing editor of the daily Lodi Sentinel.



The incoming and outgoing heads of the AEC's Division of Military Applications visited the Los Alamos Scientific Laboratory last month and toured a number of technical areas. Here, they are receiving a briefing at Pajarito site from John Orndoff, third from left, alternate N-2 group leader. Others are, from left, Rod Spence, N Division leader; LASL Director Norris E. Bradbury; Orndoff; Frank Durham, alternate N division leader; Brig. Gen. Edward B. Giller, incoming head of DMA; Brig. Gen. Delmar Crowson, outgoing head of DMA; and Edward J. Bloch, deputy general manager, AEC.

Return to Trinity

Ushered in by Los Alamos scientists, the "Atomic Age" began at precisely 5:29:45 on the morning of July 16, 1945. The test of the world's first atomic bomb was more successful than even some of the most optimistic scientists had dared to predict.

"In that brief instant in the remote New Mexico desert, the tremendous effort of the brains and brawn of all these people came suddenly and startlingly to the fullest fruition," noted Gen. Thomas F. Farrell, deputy to Gen. Leslie R. Groves, director of the Manhattan District.

As that now-famous mushroom cloud began to rise, Gen. Farrell continued, "the tension in the room let up and all started congratulating each other. Everyone sensed, 'This is it!' No matter what might happen now, all knew that the impossible scientific job had been done. Atomic fission would no longer be hidden in the cloisters of the theoretical physicists' dreams. It was almost full grown at birth."

The place chosen for the birth of the atomic age was called Trinity, a section of what is now the White Sands Missile Range in the desert of southern

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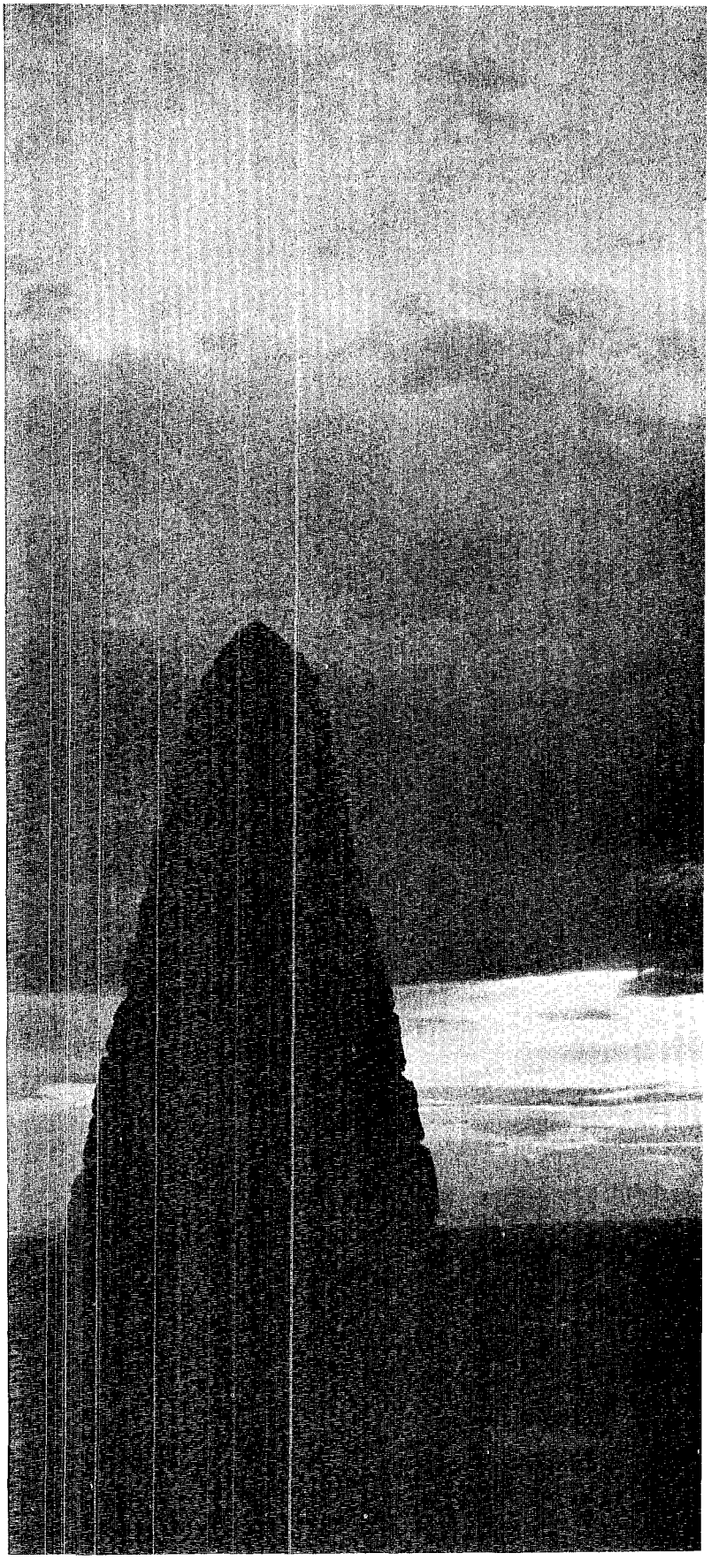
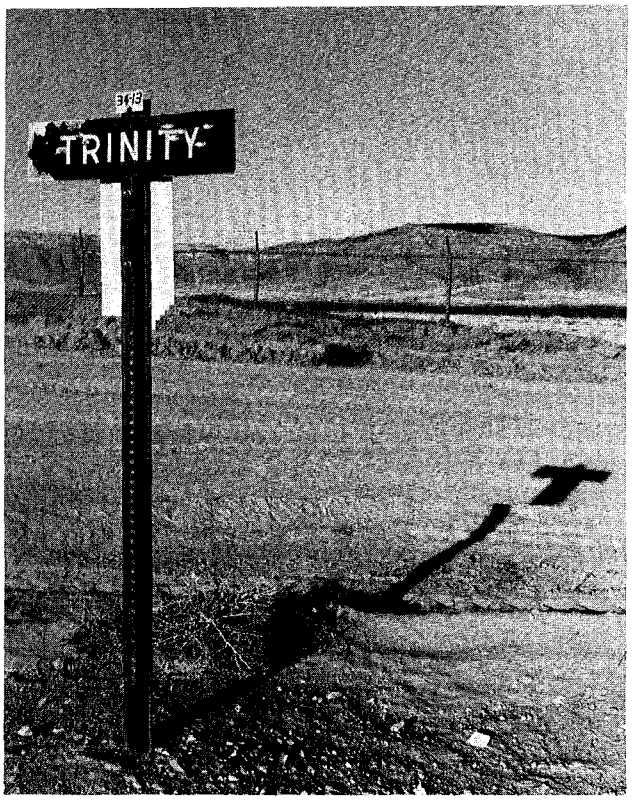


Pyramid of black volcanic rock marks ground zero at Trinity Site.



Peeling metal sign on a seldom traveled dirt road in the White Sands Missile Range is the only indication of what lies behind the fence. BELOW, Robert Porton, Pub-2, finds time and the elements have taken their toll on MacDonald ranch house, where Trinity bomb was assembled. Porton was at Trinity Site this spring to gather trinitite for the LASL science museum.

Trinity . . .

continued from preceding page

New Mexico, more than 250 miles south of Los Alamos. The site was chosen because it was within a reasonable commuting distance from Los Alamos, yet in an isolated area and far enough away to avoid any apparent connection between Los Alamos and the test site. Trinity Site was an 18-by-24-mile section of the Alamogordo Bombing Range that had been known, since the days of the early Spanish settlers, as Jornada del Muerto—Journey of Death.

Trinity Site was acquired in 1944, and during November and December, construction of the base camp was completed some 10 miles from the point selected for ground zero. A small detachment of military police moved in to guard the buildings while more construction continued. As the date for the test neared, scientists, technicians and more soldiers arrived, and by summer the population numbered about 200.

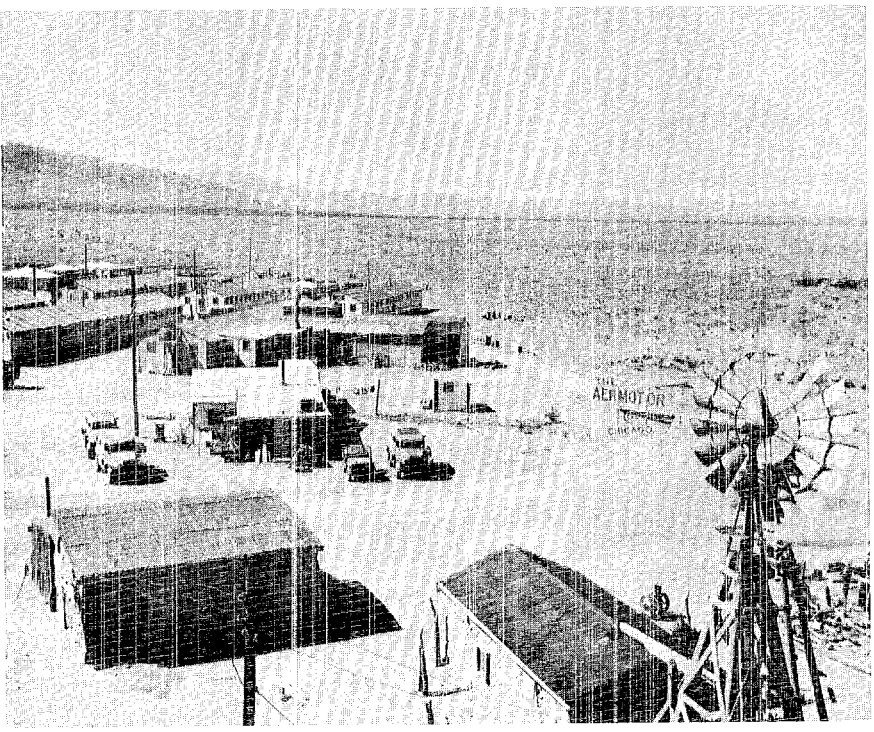
Assembly of the active components of the bomb took place in an old ranch house a few miles from ground zero, and final assembly was completed in a tent at the base of the 100-foot tower on which the bomb was exploded. Detonators were installed after the gadget had been raised to the top of the tower.

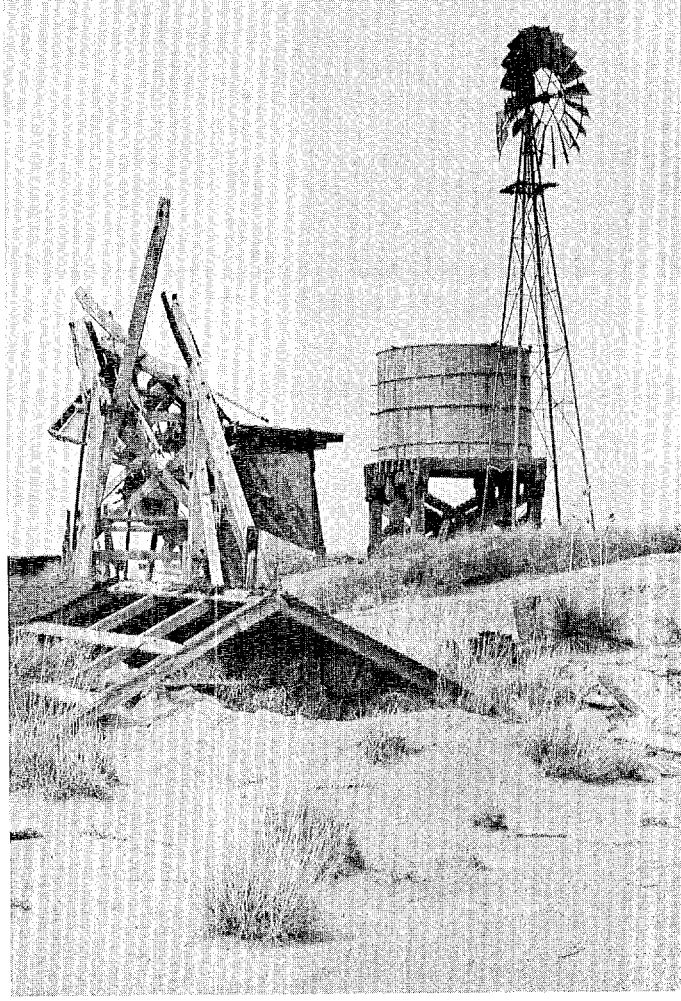
On Sunday night, July 15, thunder storms began, and the already tense scientists grew more concerned. The test was scheduled for 4 the next morning, but it looked as though the rain would continue. Pessimism about the weather combined with a reluctance to postpone the test for any length of time was reconciled as the weather began to improve a little after midnight. The test was postponed for an hour and a half. To the relief of everyone, the rain stopped at 4 a.m., but the next weather report was the crucial one: conditions were not ideal, but they were adequate.

It was some time before the world learned why dawn came twice that morning on Jornado del Muerto. Even for the scientists, who knew what kind of forces they had packaged in the gadget at the top of the tower, the spectacular, brighter-than-midday light was awe-inspiring.

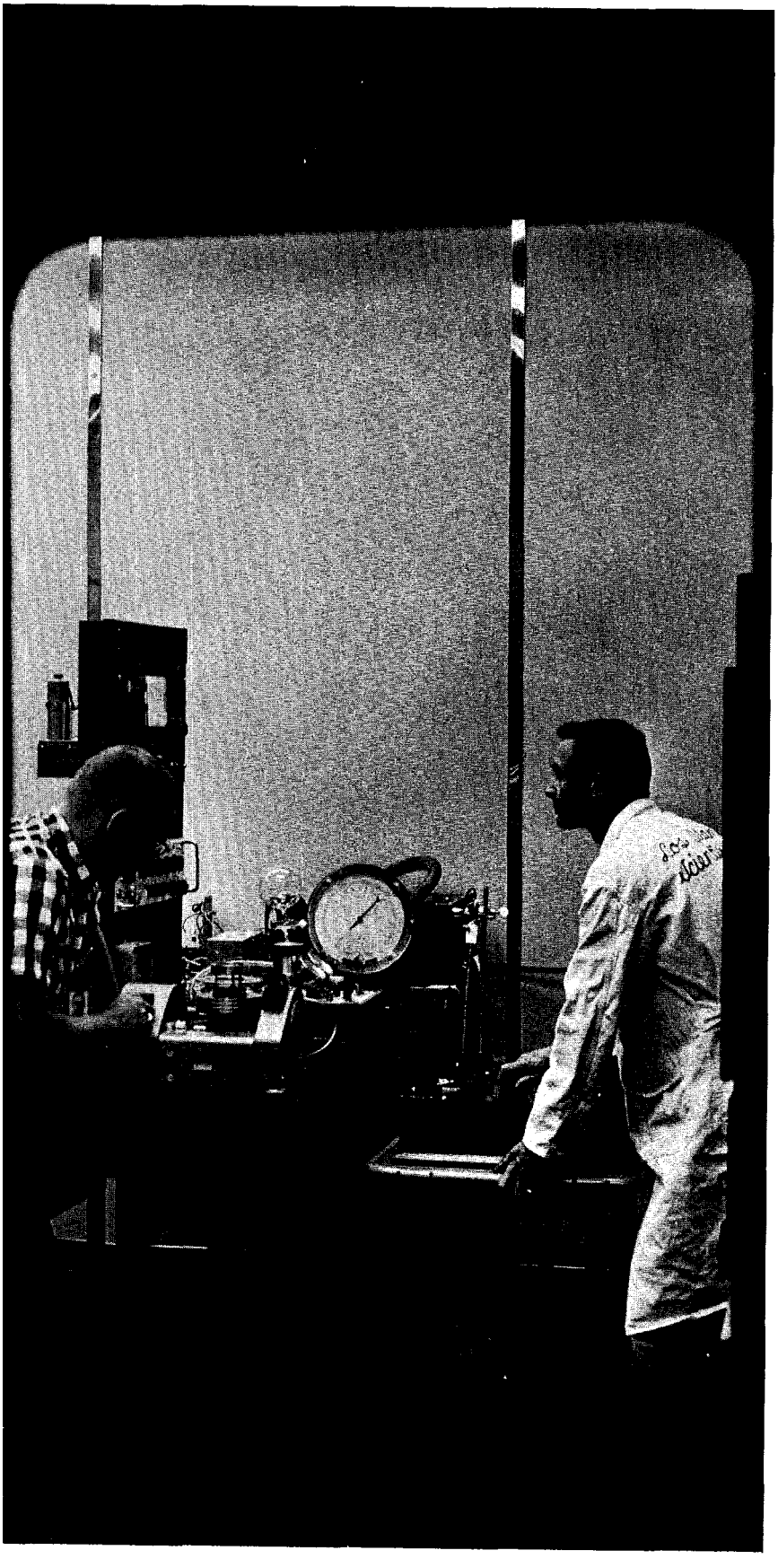
The surface of the desert in a radius of about 400 yards around ground zero literally melted. It solidified again as a green glass-like substance which was later bulldozed into piles and buried.

Now, 22 years later, LASL's Health Division has monitored the area, and a bill before Congress, if passed, will make Trinity a National Historic Site. And eventually, perhaps, the tourists will scoop up the last remaining fragments of green trinitite that can still be found amid the sparse desert vegetation.





After 22 years (right), little remains of the base camp built for the Trinity test operations in 1945 (above). Wooden windmill (at right in 1945 photo) has long since collapsed (center, 1967 photo). BELOW, LASL Director Norris Bradbury, left, and Technical Associate Director Raemer Schreiber returned to Trinity this spring. At the time of the Trinity test, Bradbury was group leader in charge of bomb assembly, and Schreiber was a member of the assembly team.

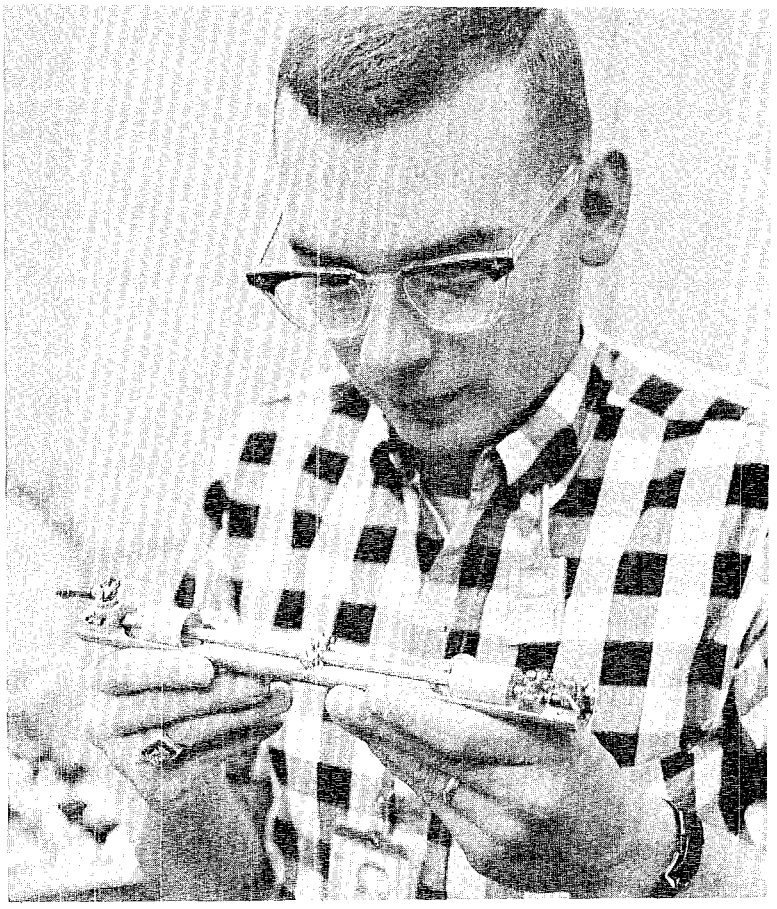


John Puckett, left, and Richard Tisinger operate microbalance in temperature-controlled room. The instrument measures gas densities with a precision of 0.01 per cent at pressures up to 500 pounds per square inch.

LASL Men Develop New Gas Densitometer

By Bob Masterson

John Puckett checks beam and two gold-plated cylindrical weights on microbalance.



WHICH WEIGHS MORE, a pound of feathers or a pound of lead?

This old loaded question has probably been, for many people, their childhood introduction to the concept of density—the mass of a substance per unit volume. After one has been exposed to the notion that a pound of lead and a pound of feathers occupy considerably different volumes, the next aspect of density likely to be encountered is embodied in the statement that "hot air rises." This simple little truism is based on the fact that as a gas is heated it expands and its density is reduced. The density of a gas is also dependent upon its pressure, as was discovered by the great English scientist Robert Boyle when he observed that doubling the pressure on a gas (at a constant temperature) halved its volume.

The determination of gas densities therefore involves the precise measurement and control of temperature, pressure and volume. At high pressures, gas permeability (the tendency to diffuse into or through solids) and other gas losses cause problems with the standard techniques of measuring gas densities.

A gas densitometer recently developed by Richard Tisinger of the W-7 group has nearly eliminated these problems and has shown its ability to measure the density of gases with great precision over a wide range of pressures. W-7 is an applied experimental physics and developmental chemistry group working on a wide variety of problems, including some development and improvement of the nuclear components of weapons.

The original motivation for building the new instrument was a desire to do more detailed research on reactions between gases and solids. Measurements of gas densities with the new instrument have wide application in various non-weapon and non-nuclear fields. Gas densities are of great general interest because many of the physical properties of a gas—for example, heat conductivity, heat capacity and viscosity—are stongly dependent on its density. In addi-

continued on next page

George Cole, right, and John Lucas, both senior mechanical desginers in SD-2, look over plans for a new version of the buoyancy microbalance which will be capable of measuring gas densities at pressures as high as 50,000 pounds per square inch.

Gas Densitometer . . .

continued from preceding page

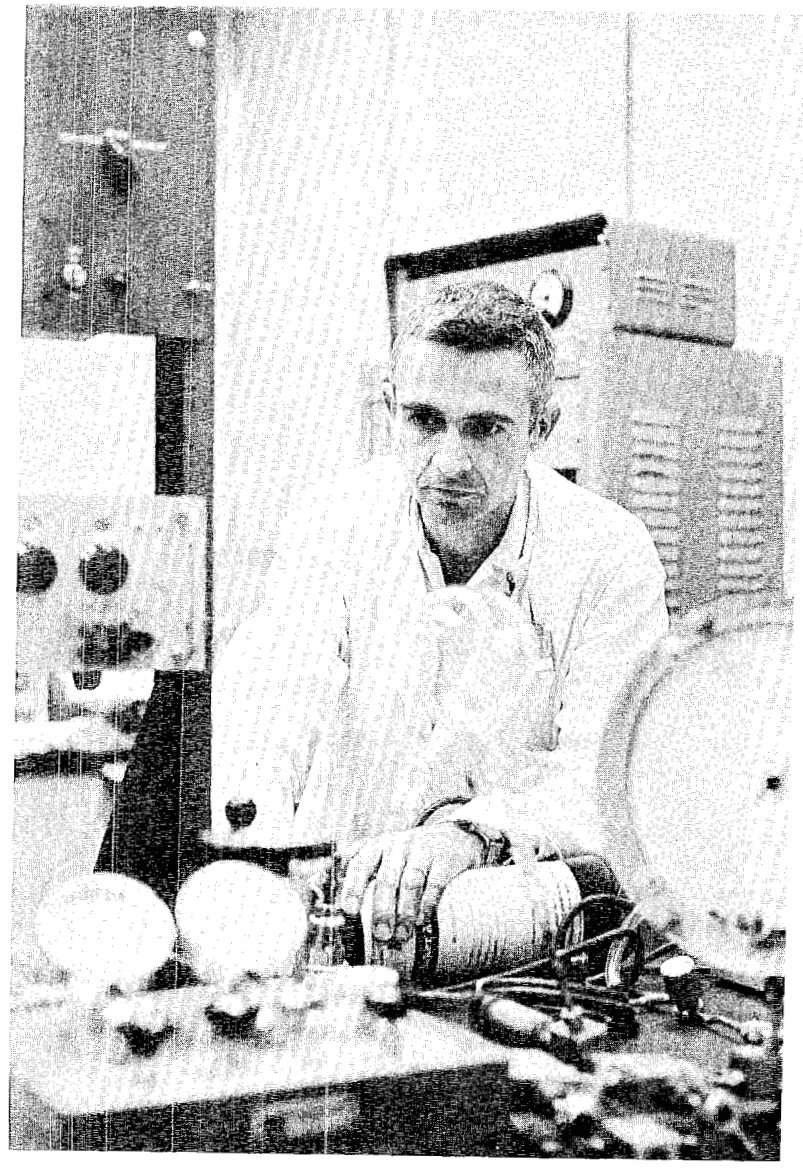
tion, the kind and rate of chemical reactions in which a gas is involved are affected by its density. All this means that gas density data have direct applications to the design of many devices, such as gas-cooled nuclear reactors, heat exchangers, gas turbines and jet engines. These data are also of great interest in the chemical and petroleum industries where high-pressure, high-temperature gases are used in chemical production.

The densitometer designed by Tisinger is an adaptation of an existing instrument, an electromagnetic buoyancy microbalance, which has been used for many years by chemists to determine gas densities at low pressures. This type of device was redesigned to allow measurements at pressures up to 500 pounds per square inch and to minimize the volume of gas required to make a measurement. For the new densitometer the gas volume is only 75 cubic centimeters (cc)—equivalent to the volume of a ball a little more than two inches in diameter.

The chief mechanical advantages of this type of instrument are economy of gas and relative simplicity of construction and operation. Gas economy is important in cases where the gas under study is expensive or radioactive, toxic, flammable or otherwise hazardous.

Working with Tisinger on the design were John M. Puckett of W-7 and James D. Cramer who provided assistance early in the work before moving to W-8. The densitometer was completely fabricated in the W-Site branch shop, which is headed by Frank D. Burditt who machined most of the components himself. Dave McFerrin of the SD-4 inspection group inspected the parts and handled their precise alignment and adjustment during their assembly.

The instrument consists basically of a small equal-arm balance, with a 20-gram mass of different density on each end, immersed in a gas within a pressure vessel. The masses, one of brass and the other of aluminum, have the same surface area and are gold



Richard Tisinger checks out a portion of the microbalance system. His left hand rests on a cylinder of ultrapure argon gas used to calibrate the instrument.

plated to minimize gas adsorption effects. Since they have different densities, they have different volumes, and, like any mass immersed in a medium, each experiences a buoyant force equal to the weight of medium displaced by its volume. The two masses therefore experience different buoyant forces, and the net force, as measured by the balance, is proportional to the density of the gas.

The central beam of the balance is a rod of stainless steel supported by two tungsten pivots resting on sapphire jewel bearings. The radius of the tungsten pivots is approximately 0.002 inch, and the radius of the jewels is 0.003 inch. The complete balance fits within a stainless steel pressure vessel with an inside diameter of one inch, a wall thickness of ⅛ inch, and a length of 10 inches. The gas is introduced through a flexible hose into one end of the pressure vessel, and electrical leads pass through a sealing gland in the opposite end.

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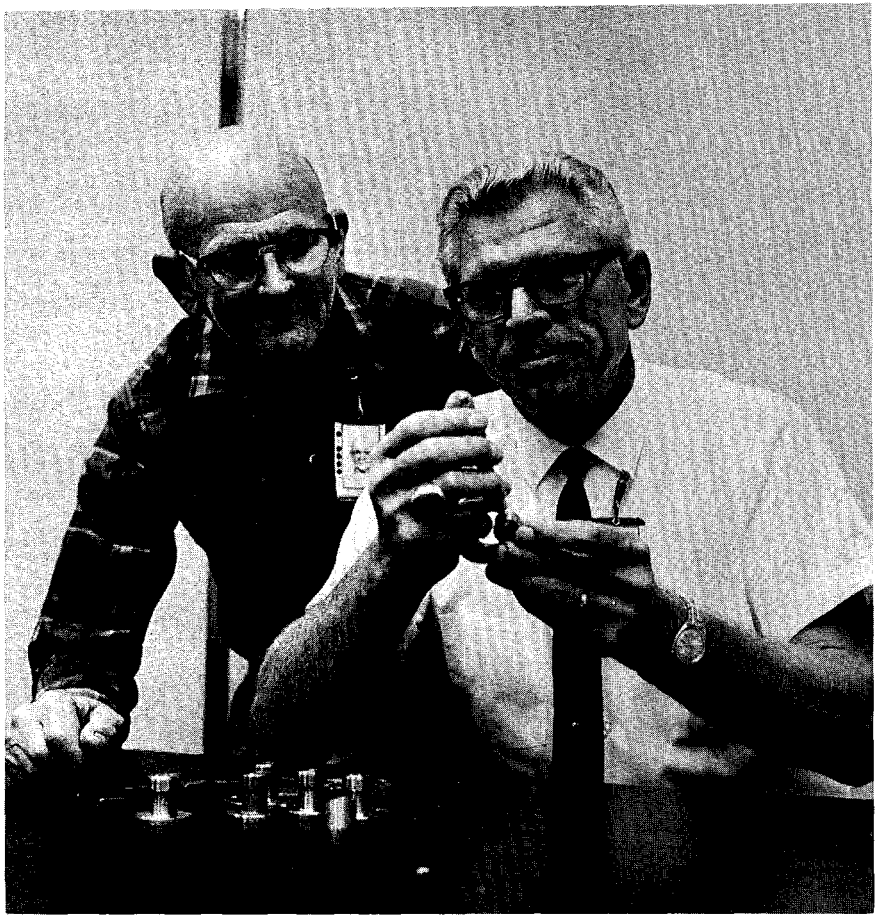


Frank D. Burditt, left, who heads the W-Site SD-5 branch shop, looks on as Dave McFerrin of the SD-4 inspection group checks one of the weights for the buoyancy microbalance.

Gas Densitometer . . .

continued from preceding page

The balance is used as a null device. As gas is admitted to the pressure vessel, the end of the beam with the aluminum mass rises. This causes a metallic alloy core of high magnetic permeability mounted on this end of the beam to move within the central cavity of a linearly variable differential transformer. The core disturbs the magnetic field linking the primary and secondary coils of the transformer, thereby causing a change in its voltage output (in the millionths of volts range) as read on a voltmeter. That is, the displacement of the beam causes the displacement of the needle of the voltmeter from the null or zero position. A linear beam displacement of about one micron (40 millionths of an inch) can be detected in this manner. This corresponds to a change in density of the buoyant gas of 4 ten-millionths of a gram/cc. This is 3 ten-thousandths of the density of air at room temperature and atmospheric pressure.

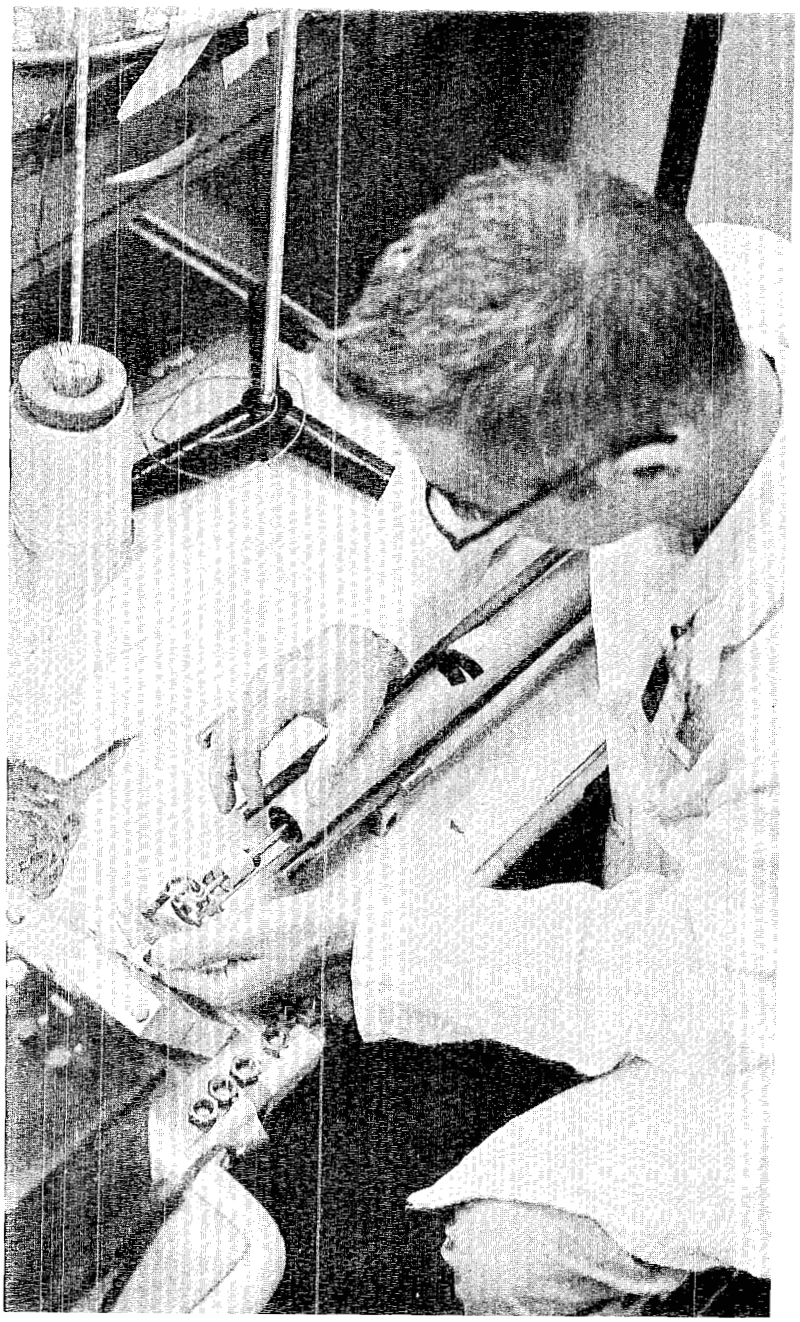
This displacement is counteracted by applying an electro-magnetic force to a permanent magnet mounted on the opposite end of the balance beam. This magnet is positioned between a set of two parallel coils mounted above and below it. As an electrical current is passed through the coils, the magnetic field thus produced exerts a restoring force on the permanent magnet.

In practice, the needle of the voltmeter reading the output of the transformer is returned to the null position by adjusting by hand the current in the restoring coils by means of the variable DC power supply connected to the coils.

The coil current is measured by means of a digital voltmeter which reads the voltage drop across a standard resistor in series with the coil. It is this digital voltmeter which is then read to give the density of the gas, and the instrument must therefore be calibrated using a gas such as argon whose density is known over a range of pressures.

The gas pressures are measured with a piston gauge with an accuracy of 0.015 per cent. The gas temperature is obtained by measuring the temperature of the outside of the pressure vessel with a thermocouple whose reference temperature is a constant-temperature oil bath. The temperature of the oil bath is in turn measured with a platinum resistance thermometer. This arrangement allows

Richard Tisinger slips the microbalance assembly into its stainless steel pressure vessel.

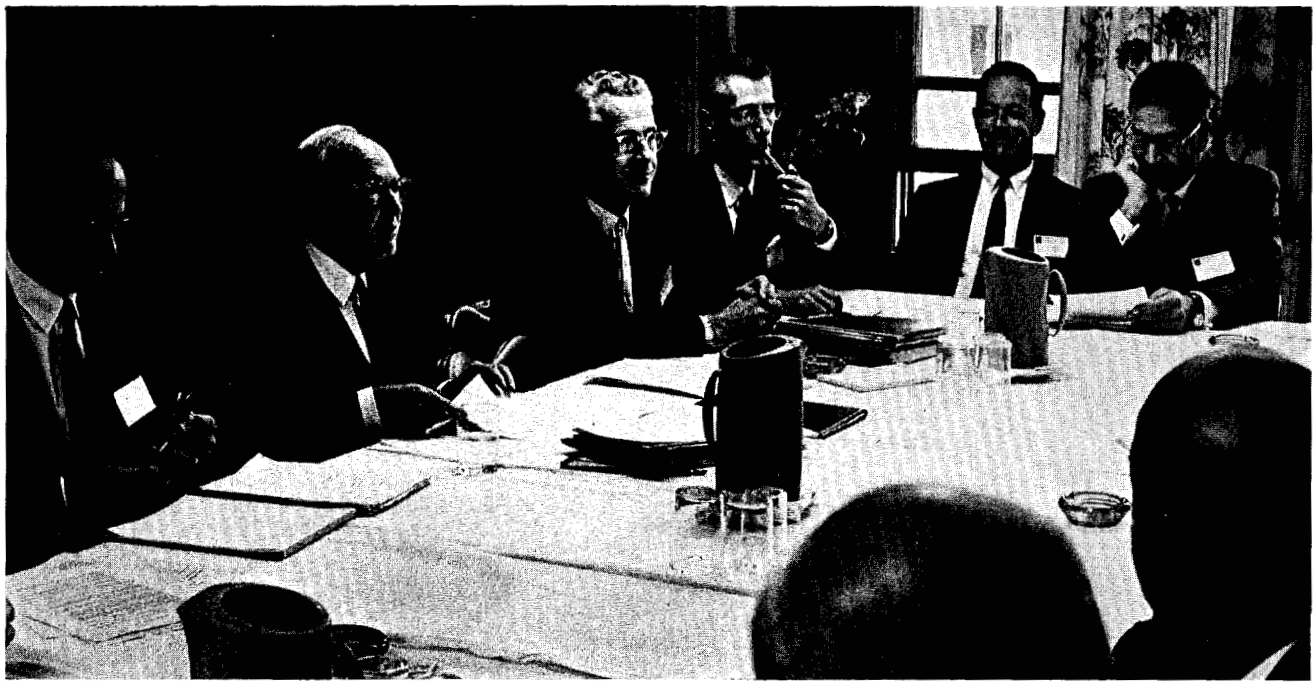


the gas temperature to be measured to within 0.018° F. In order to reduce temperature fluctuations in the system, the instrument is located in a temperature-controlled room, where the air temperature never varies more than 0.4°F.

In actual performance, the buoyancy microbalance densitometer is able to measure gas densities at pressures up to 500 pounds per square inch with a precision of 0.01 per cent. Density data of such high precision are necessary in predicting the behavior of gases under various conditions.

The microbalance is currently being used to measure the densities of hydrogen, helium, nitrogen and others, to provide fundamental knowledge about gas behavior.

In addition, Tisinger and his co-workers in W-7 are presently working on the design of a buoyancy microbalance to measure gas densities at pressures as high as 50,000 pounds per square inch. This instrument will undoubtedly provide even more data of vital interest to our national defense as well as to many areas of basic and applied science and engineering.



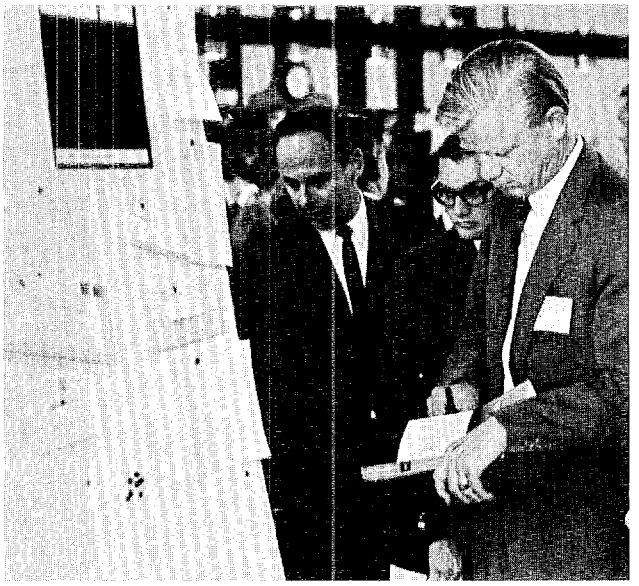
During ANS board meeting, retiring president Sidney Siegel (second from left) turns presidency over to R. E. Schreiber, LASL technical associate director (third from left). Board member James Lilienthal, CMB-7 (fourth from left), will assist Schreiber during his year as ANS president.

LASL Scientists Active At ANS Meeting

ABOVE, D. W. Bergen, W-8, presents paper at one of the meeting's 75 technical sessions. BELOW, Tom Wimett, N-2, checks over program with projectionist before start of the technical session on reactor dynamics which he chaired.

Story and photos
by Bob Masterson

As board of directors meeting begins, Hugh Paxton, N-2, looks through committee reports and correspondence.



G. Robert Keepin, N-6, joins crowd around the message board at hotel where ANS meeting was held.

THE LOS ALAMOS Scientific Laboratory was well represented at the 13th annual meeting of the American Nuclear Society (ANS) last month in San Diego, Calif. Attending the largest ANS meeting ever, more than 1600 scientists and engineers from all parts of the country heard more than 500 technical papers grouped into 75 sessions, each of which covered a particular field. The wide range of subjects covered by these papers reflect the unusual nature of the American Nuclear Society. Unlike most scientific and engineering societies, the 7,000 ANS members are not all trained in the same discipline, but rather represent almost every scientific specialty involved in nuclear science and engineering.

LASL research and development was reported in seven papers authored by a total of 11 Laboratory staff members from six different Laboratory groups.

Los Alamos was further represented in the meeting's technical program by Thomas F. Wimett, N-2, and Dale M. Holm, K-1, who each served as chairman of one of the technical sessions.

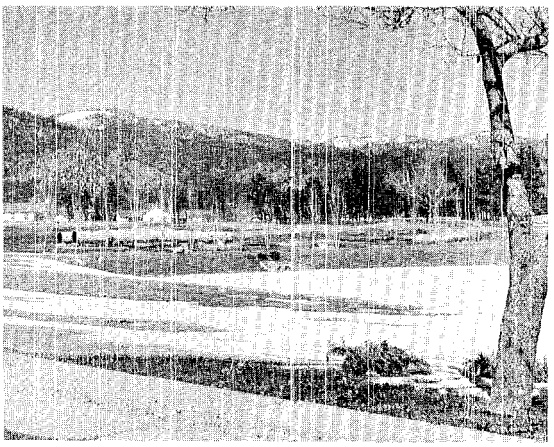
In addition, several other LASL people attended the meeting just to hear the papers from other laboratories and to take part in the impromptu discussions that contribute so much to the value of scientific meetings.

Besides its primary purpose of the exchange of technical information, the ANS meetings also provide an opportunity for meetings of the committees, panels and boards that plan and administer the society's programs. Los Alamos was equally well represented in these meetings also.

One of the busiest men in San Diego during the meeting was LASL Technical Associate Director Raemer Schreiber, who, as the newly-elected president of the ANS, attended as many committee meetings as he could find time for and, during the board of directors meeting on the last day of the meeting, officially began his term as chief executive of the society. Also present at this board meeting were Directors Hugh Paxton, N-2 group leader, who also is a member of the honors and awards committee, and James Lilienthal, CMB-7 group leader, who had also just completed six years of service on the publication committee, the last three as chairman.

At the membership committee meeting, Glen A. Graves, N-2, finished a term of membership and Raphael LaBauve, K-1, began one. The public information committee meeting was attended by Robert Masterson, PUB-DO, and the executive committee meeting of the society's Remote Systems Technology Division was attended by division vice chairman John Schulte, CMB-14 group leader, who this month completes a year as chairman of the Trinity Local Section (covering New Mexico) of the ANS.

For those attendees who had the time and the strength, the program of events at the meeting included luncheon addresses by University of California (at San Diego) Chancellor John S. Galbraith and the newest member of the U.S. Atomic Energy Commission Samuel M. Nabrit; a banquet and an address by U.S. Congressman Craig Hosmer; and tours of the San Onofre Nuclear Generating Station and the John Jay Hopkins Laboratory of the General Atomic Divison of General Dynamics Corp.



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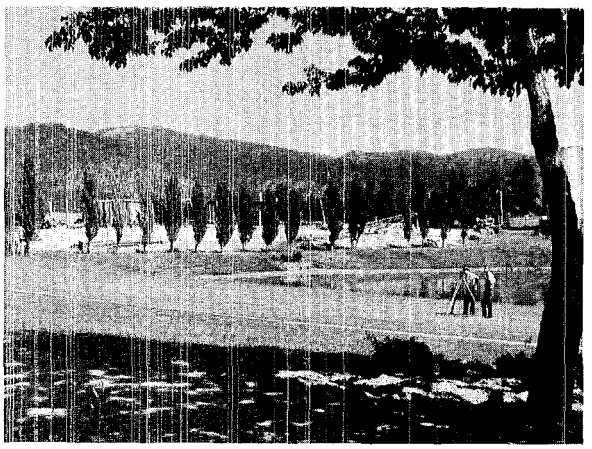

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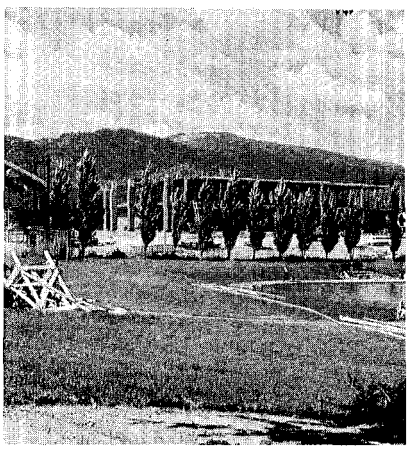


August, 1966

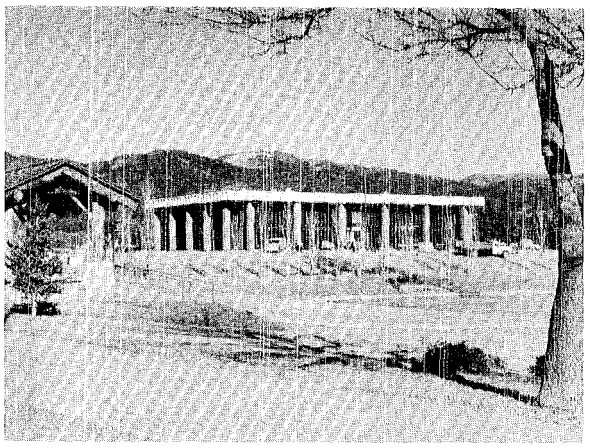
Los Alamos county commissioners, from left, Stephen Stoddard, Martin Gursky and Dr. James Loucks and Los Alamos AEC area manager Herman Roser sign documents transferring property from federal government to county. Other participants in the ceremonies are Robert Y. Porton, at podium, Gov. David Cargo, Rep. E. S. Johnnie Walker, former county commissioner Ed Hyatt and Sen. Joseph Montoya.

Transfer and I
Milestones Ir

LOS ALAMOS COUNTY came of age this summer with the dedication of its new County Municipal Building and the official transfer of more than 17 million dollars worth of public use lands, roads, buildings and utility systems from federal to county ownership.

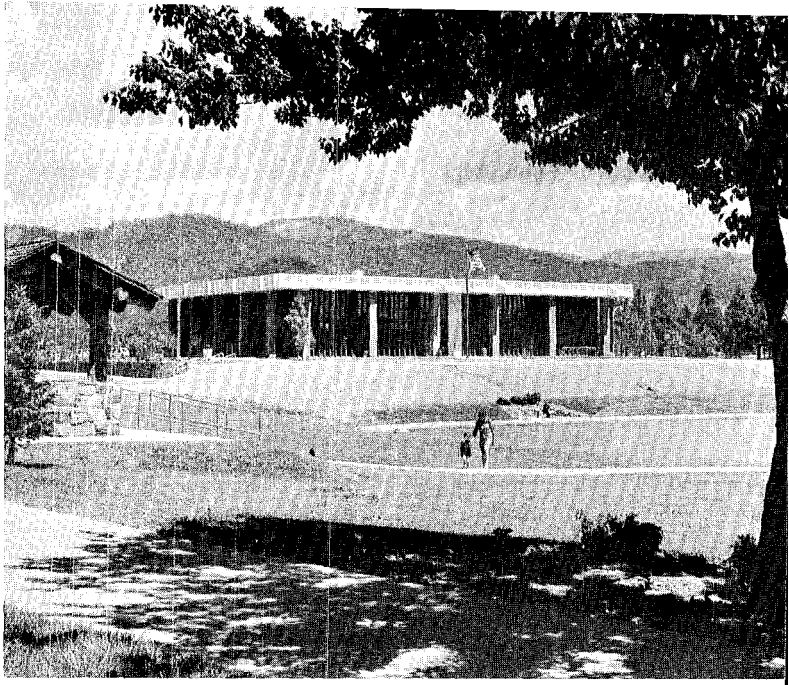
The building dedication ceremony June 24 included the formal signing of the transfer documents turning the properties over to the county effective July 1. This target date had been set five years ago, after Congress amended the Atomic Energy Community Act of 1955 to allow disposal of the Los Alamos community by the Atomic Energy Commission.

In 1960 the AEC had appointed citizen task forces to study disposal. After hearings in the spring of 1962 before the subcommittee on communities of the Joint Committee on Atomic Energy, Congress passed the enabling legislation, and the AEC was given five years to carry it out. During this five-year period, Los Alamos County operated many of the municipal services by contract with the AEC, in



February, 1967

Dedication:
n Los Alamos



Where old Tech Area 1 changed the course of world history in the mid-forties, now the new Los Alamos County Municipal Building occupies a prominent spot next to Ashley Pond. Water tank showing at extreme right of construction photos above has since been moved to the Western Area. Historical landmark at left was built last summer to mark the spot where parts of the first atomic bombs were assembled. Interior photo below was taken from the Ashley Pond entrance.

order to give the county experience in operating the municipal and utility functions before actually assuming ownership.

As part of the disposal process, Congress authorized nearly nine million dollars for improvements to public properties—including $750,000 for the new County Municipal Building.

"The County Municipal Building symbolizes the development of Los Alamos as a 'normal' New Mexico community, and the County of Los Alamos as a 'normal' local government," according to Paul Noland, Los Alamos County administrator.

Among those who took part in the dedication and transfer ceremonies were Herman E. Roser, AEC Los Alamos area manager; Los Alamos County commission members Dr. James E. Loucks, commission chairman, Stephen D. Stoddard and Martin Gursky; New Mexico Governor David F. Cargo, Senator Joseph M. Montoya and Congressman E. S. Johnnie Walker. Robert Y. Porton served as master of ceremonies.

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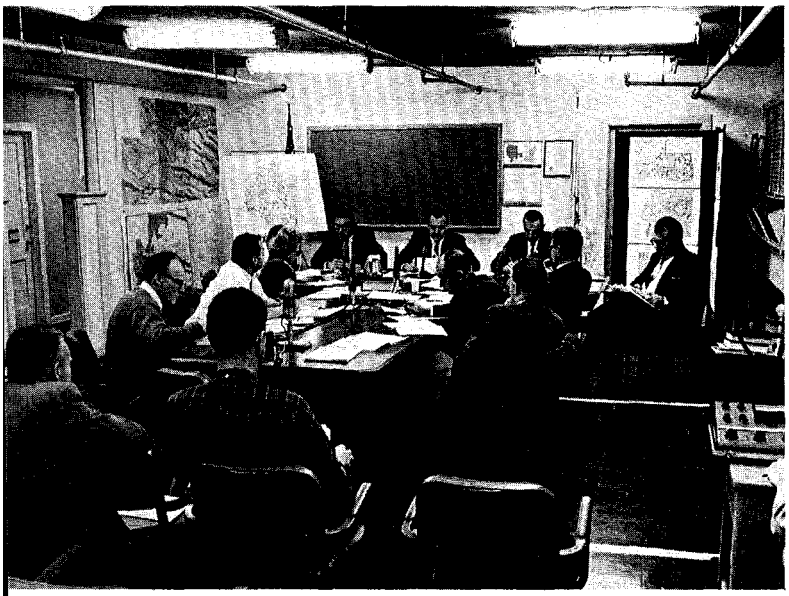

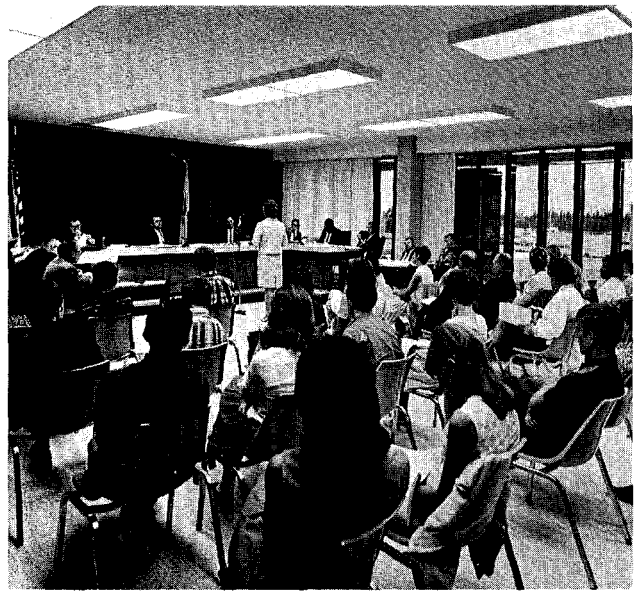

One of the sharpest contrasts between the old courthouse and the new County Municipal Building is the county commission chambers. Cramped quarters in the old building, above, provided room for only a few citizens to attend meetings. The June commission meeting in the new building, above right, was attended by a full house, with plenty of elbow room for everyone.

transfer and dedication

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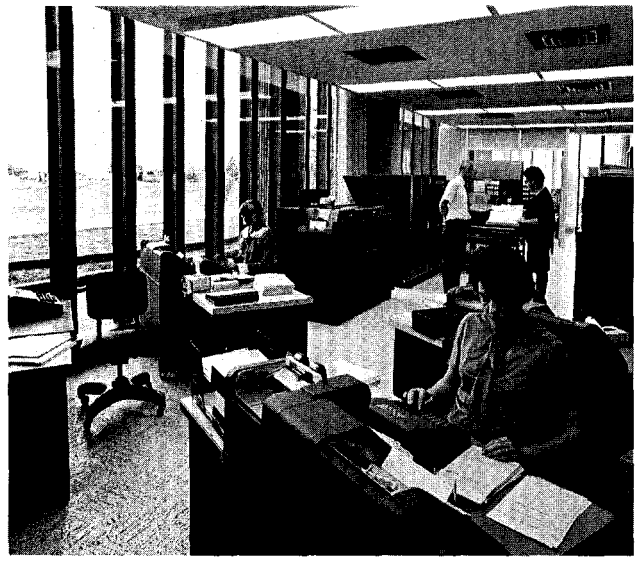
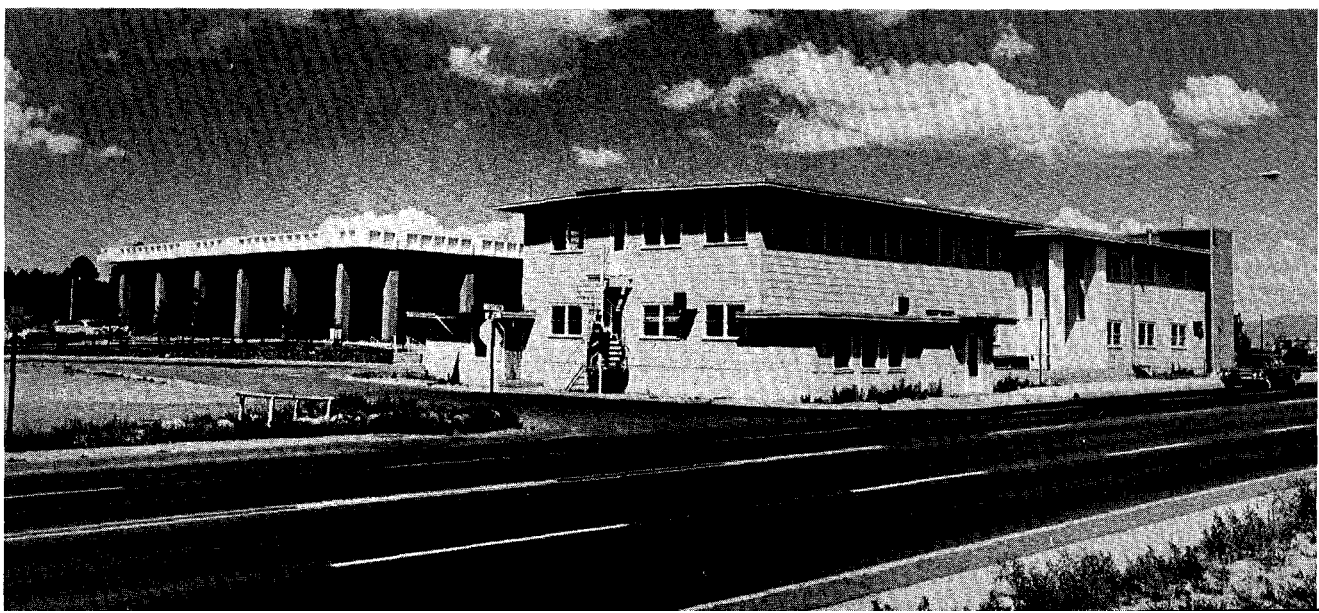
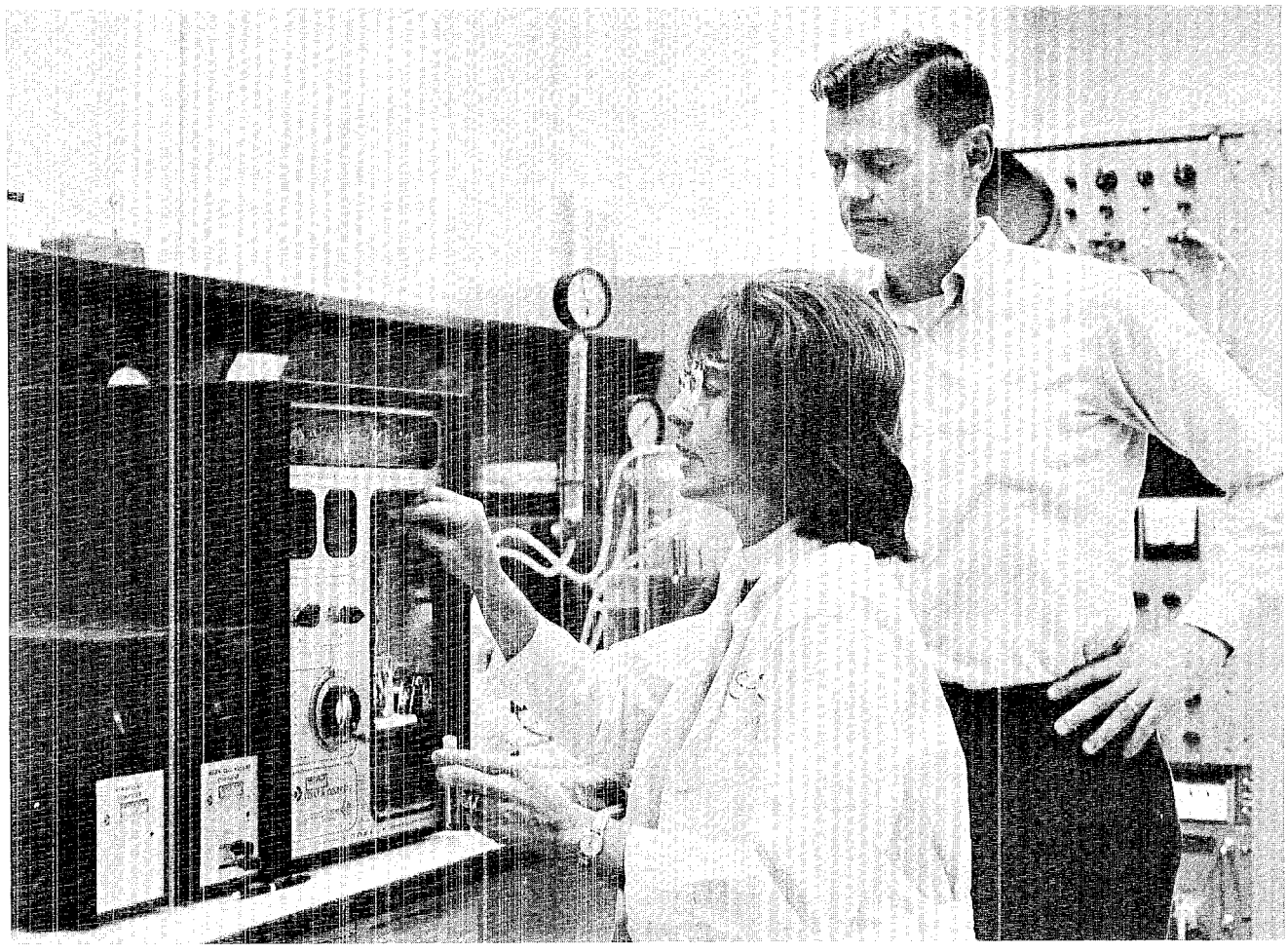


BELOW: Old county courthouse, foreground, was used by the county from early 1956 until this spring, when personnel moved into the new building.

ABOVE: Most of the equipment in the county's new data processing center was transferred from the Zia Company, with some from the AEC.





Norma Jean Basmann analyzes blood from mice used in the RF studies as H-4 veterinarian L. M. Holland looks on.

Mice Aid In Studies On RF Wave Dangers

By Bill Richmond

It has been known for years that radio frequency (RF) waves can be dangerous to the human body—both from the thermal effects and from the insidious effects relating to the nervous system and the reproduction of blood cells.

The new meson facility planned for the Los Alamos Scientific Laboratory will utilize RF waves. Thus the possible dangers must be minimized to insure that working conditions are maintained as safe as possible.

To this end, John Spalding of H-4 and Robert Freyman of P-1 are conducting a series of experimental studies with mice to determine precisely what happens in the

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John Spalding places mice in individual exercise wheels. The RF-exposed mice continued to be just as active as mice in the control groups.

RF studies . . .

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RF ranges of 200 and 800 megacycles—the two ranges at which the meson facility will operate.

There has essentially been no research work done in connection with RF waves at 800 megacycles and very little at 200 megacycles, Spalding said. "There are no good, complete studies on the long-term effects or on any possible residual effects," he said.

The study began about six months ago and is scheduled to continue for about another year. Mice have a life span of about 22 months, and this study will allow Spalding and Freyman to observe the RF effects through the major portion of the life span.

With one exception, there have been no adverse effects on the mice from the RF waves. This one exception occurred when the mice were placed in the center holes of the 12-hole cage directly in the center of the RF beam at a certain distance from the RF source. Four mice in this so-called "hot spot" died from an increase in body temperature. This emphasized the fact that there are danger spots which must be avoided.

There are established maximum permissible doses for RF, but there also is some question as to the adequacy of these limits. The Army has a limit of 10 milliwatts per centimeter squared of tissue. However, Freyman has suggested a limit at LASL of one milliwatt per centimeter squared.

"There is really no reason for us to tolerate 10 milliwatts," he noted, "since we are not radiating RF waves from an antenna in all directions but into a tight cavity (in the meson facility)."

Freyman also said there will be area alarms installed throughout the facility, and should the radiation level exceed one milliwatt at any time, these alarms will sound, and all personnel will evacuate the area.

The present preliminary studies consist of exposing one group of mice, known as the "RF mice," for two hours daily to 800 megacycles. During this time they receive 43

milliwatts per centimeter squared of tissue—43 times what the maximum permissible limit will be at the meson facility. This is a constant two-hour exposure, administered once each working day.

After 20 weeks of exposure (200 hours), Spalding said there was no change in activity of the RF (exposed) mice or the two control groups. One control group, known as the "sham control group," is handled just like the RF mice and placed in the cage, but the RF power is not turned on. The other control mice are not handled at all but merely left alone in their their cages.

The mice continue to be active regardless of whether they are exposed, and they turn their exercise wheels in a normal manner.

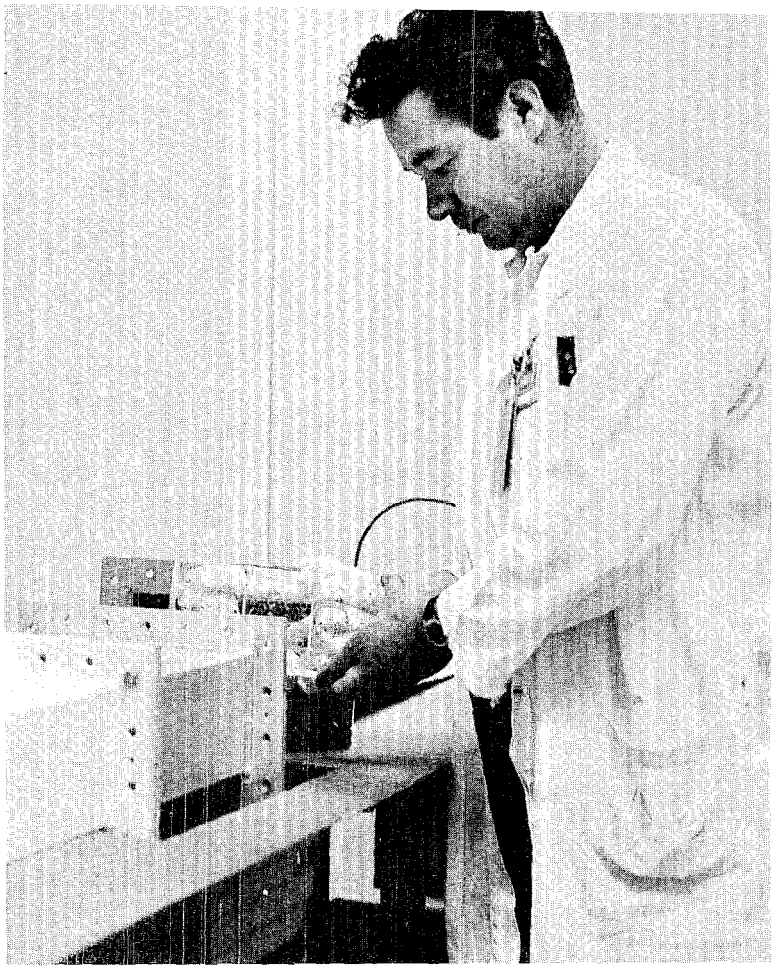
The mice are also weighed, and no difference in body weight has been detected between the RF group and the sham control. However, the second control group, which is not handled each day, was significantly heavier. Spalding attributes this to the effects of handling.

"But if we had not had the third group, someone might conclude that the RF was causing a weight loss, which is not the case," Spalding said.

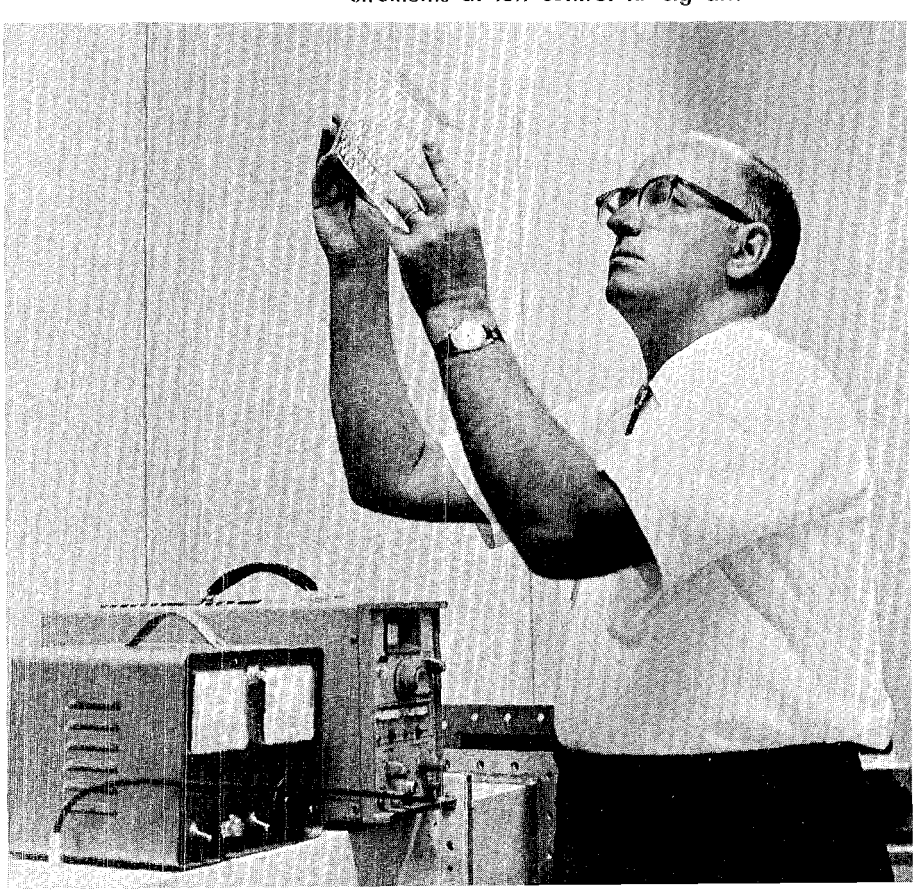
The experiments also involve blood studies. Samples of blood are taken from the eyes of the mice, and studies are made to determine possible damage to the bone marrow or blood-forming tissues. No damage has been uncovered thus far.

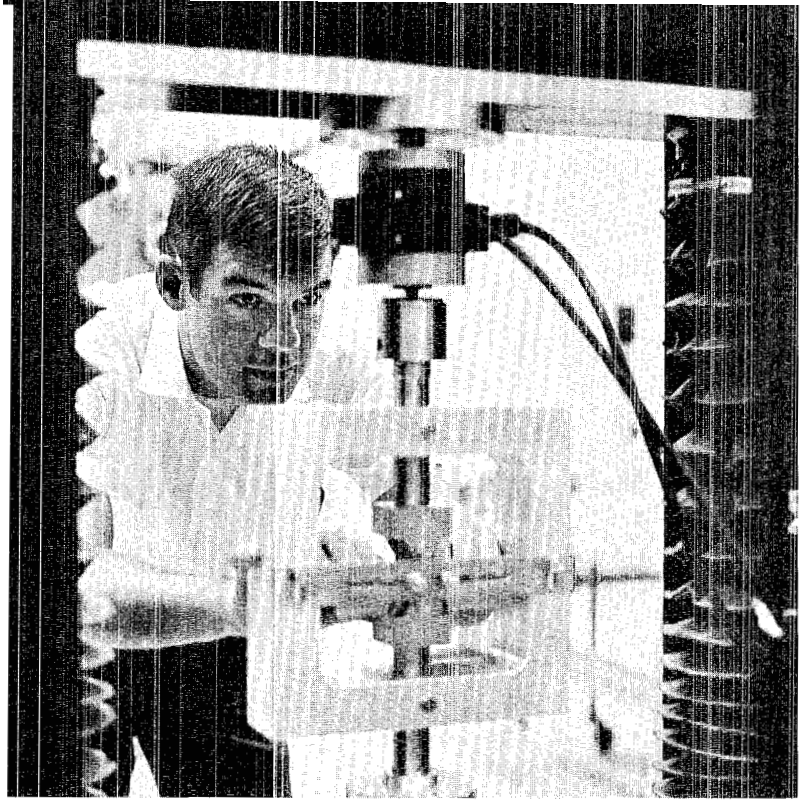
Future studies will involve other mice with a longer exposure per day at the 10 milliwatt level, and these mice will also be followed throughout their life span.

By the time the meson facility is operational in late 1971, a comprehensive study of RF waves at 200 and 800 megacycles will have been made, and safety limits will have been set. MP division personnel have said they will have no problem in staying within these safety limits.



ABOVE, Ruben Archuleta inserts cage of mice into "tunnel" where they will be exposed to the RF waves. BELOW, Robert Freyman inspects cage in which mice are given their RF "doses." Instruments at left control RF signals.

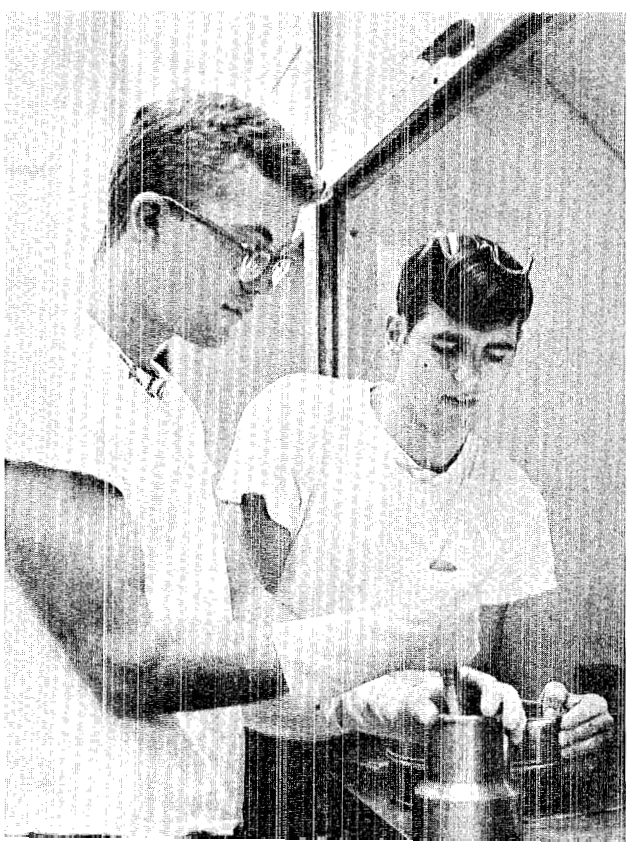




Bill Brown, of Atlanta, Ga., a graduate student at the College of Wooster, Ohio, is a research assistant in N-1 this summer. Here he tests the strength of samples of graphite elements.

Allan Tesche, son of the Fred Tesches, Los Alamos, checks sanding belt as he sorts items in the SP-3 stockroom. Allan is a student at the University of California, Davis.

Mike Benziger, left, breaks up niobium carbide discs as Mark Hessing screens tungsten powder for the CMB-6 powder metallurgy section. Both are from Los Alamos. Mike is a student at University of New Mexico; Mark attends New Mexico Institute of Mining and Technology.



Summer Jobs At LASL: A Study in Variety

Richard Sealock, a graduate student at Iowa State University and a research assistant in N-1 this summer, adjusts the lens in a laser light path.

Mark Leachman, working in H-6 this summer, prepares for three-day raft trip down Rio Grande as part of a joint study by H-6 and U.S. Geological Survey. He is the son of the Robert Leachmans, Los Alamos.

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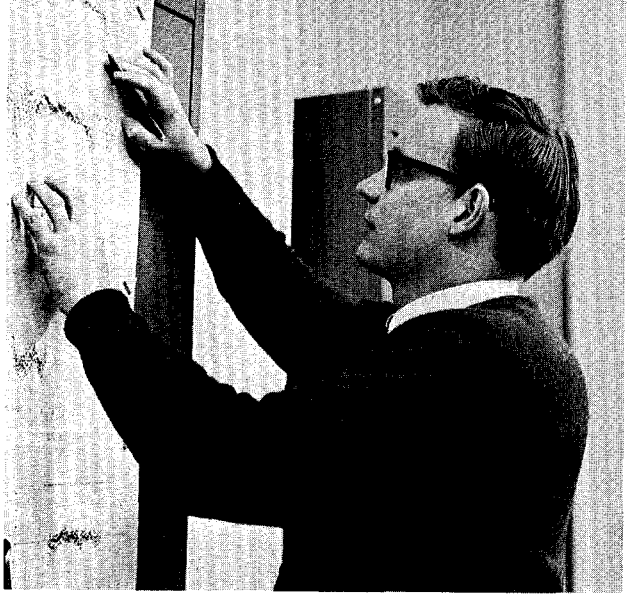
ABOVE, Gil Gallegos, son of Mr. and Mrs. Carlos Gallegos, Los Alamos, drafts electrical drawings for P-9's tandem Van de Graaff. He attends New Mexico State. LEFT, Luana Howes, daughter of Mr. and Mrs. Robert Howes, Santa Fe, is working in H-5 this summer. She is a student at Colorado State University.

Martha Ennis, daughter of the Malcolm Ennises, Los Alamos, uses automatic counter in J-11 to count samples of material from recent underground test. She attends the University of Colorado.



Robert Perisho, of Mankato, Minn., a Yale graduate student with W-8, plots computer output on formula he developed to predict nucleosynthesis in stars.

Summer Jobs . . .

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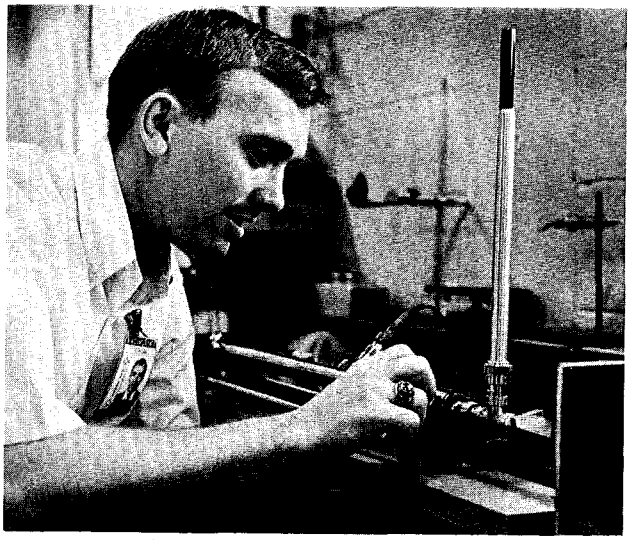
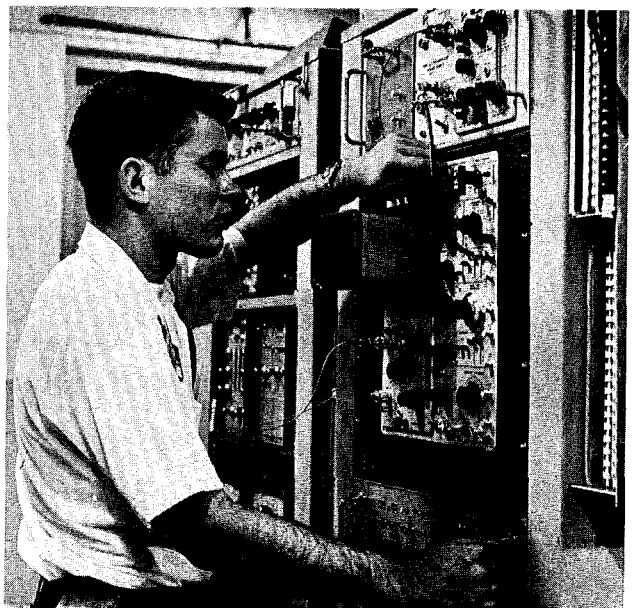
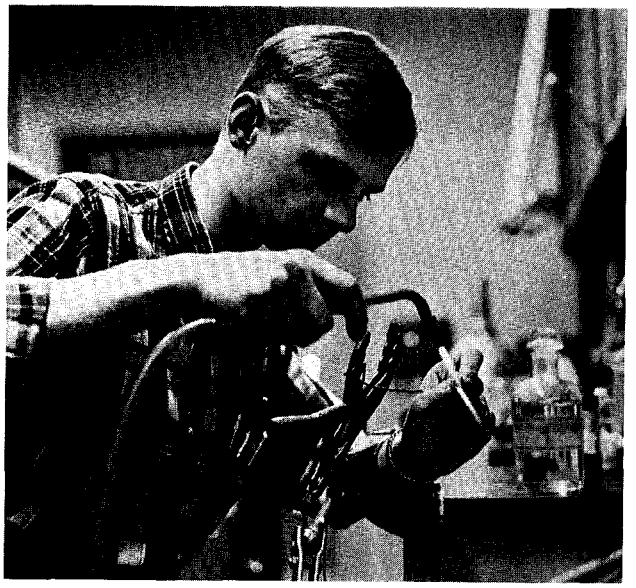


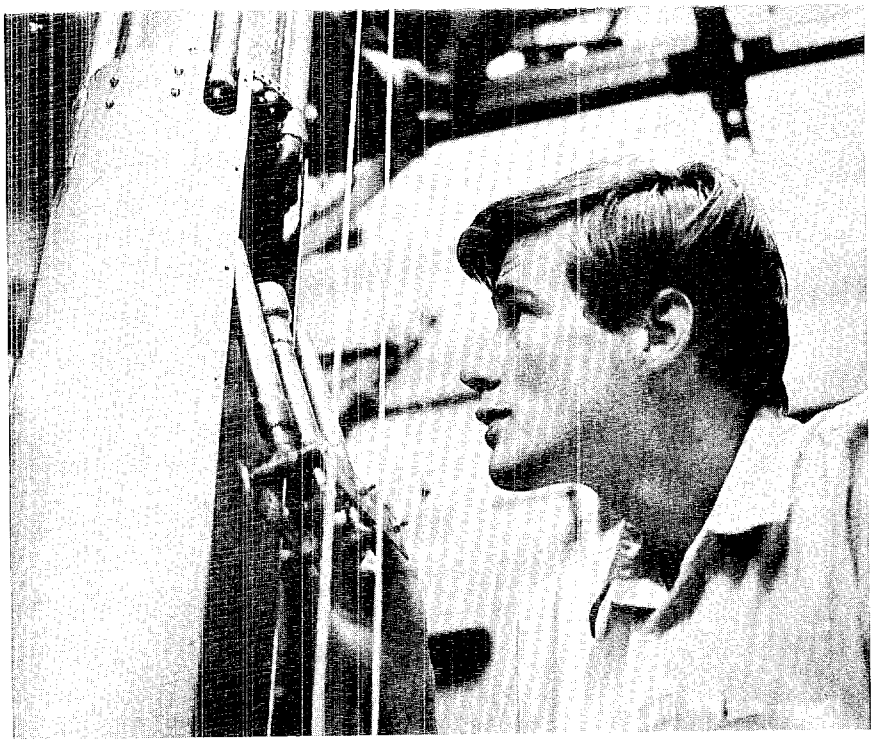
Jim Matthiesen, above, uses microwave equipment, and Kurt Liewer, below, checks gamma spectra. Both are graduate students working at GMX-1. Jim attends MIT, and Kurt attends the University of Washington.



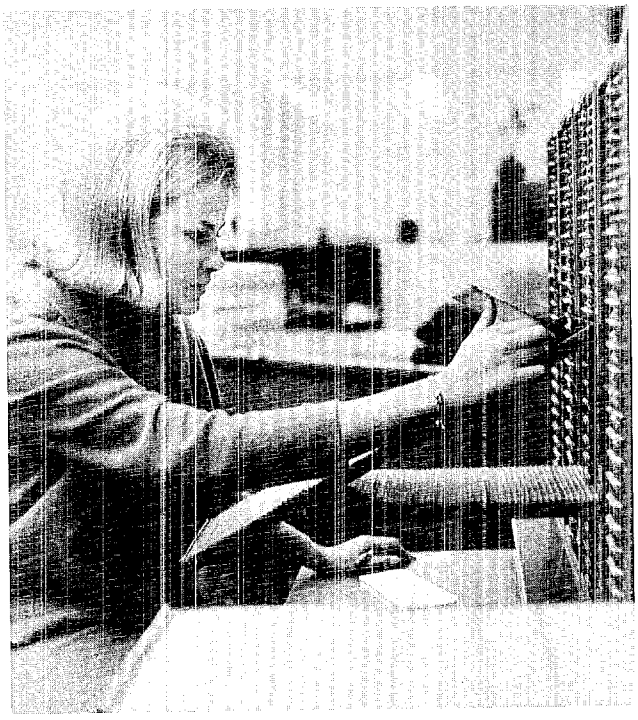
David Kohlstedt, a graduate student at the University of Illinois, uses gas-oxygen torch to do silver soldering on thermocouples for CMF-9.

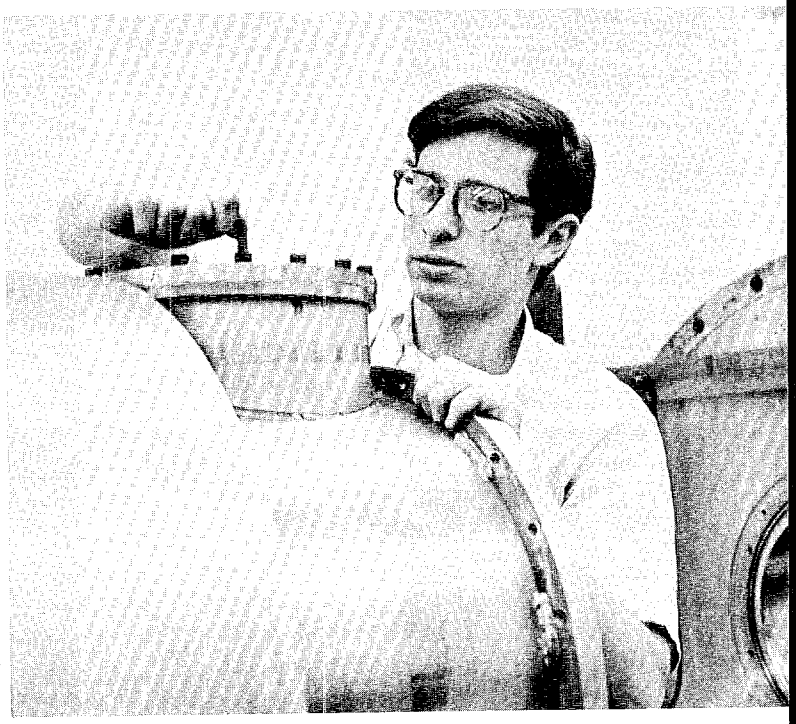


Martha Naranjo, daughter of the Juan Naranjos, Espanola, is working in J-1 this summer. She attends New Mexico State University.



ABOVE, Zachary Fisk, a graduate student at Harvard working in CMF-9 this summer, checks part of He^3 refrigerator. BELOW LEFT, Penny Robinson, daughter of the James Robinsons, Los Alamos, works in SP-3 warehouses this summer. She attends Colorado State. BELOW, Herb Eisenberg, a graduate student at Polytechnic Institute of Brooklyn, adjusts polarized ion source used in conjunction with P-9 Van de Graaff generator.





The Technical Side

Presentation at Sandia Corporation, Albuquerque, N.M., May 17:

"Development of Dense Plasma Focus" by J. W. Mather, P-7. (Invited talk)

Colloquium, Department of Physics, University of Wisconsin, Madison, Wisc., May 19:

"Vela Satellite Observations of the Interplanetary Plasma" by A. J. Hundhausen, T-12.

Colloquium, University of Washington, Seattle, Wash., May 22:

"Nuclear Physics and Los Alamos —Past, Present, and Future" by Louis Rosen, MP-DO.

Physics Seminar, University of Wyoming, Laramie, Wyo., May 23:

"Polarization Experiments in Low Energy Neutron-Proton Scattering" by James E. Simmons, P-DOR.

Presentation at Mesa Elementary School, Sixth Grade Class, Los Alamos, N.M., May 26:

"Environmental Tests and Machines" by Norman K. Kernodle, GMX-3.

Presentation at Houston Manned Space Flight Center and Marshall Space Flight Center, Huntsville, Ala., June 1-2:

"Status of Rover Reactors" by Keith Boyer, J-DO (Classified talk)

Presentation at Regional Civil Defense Meeting, Carlsbad, N.M., June 2:

"The Palomares Weapons Incident" by W. H. Langham, H-4 (Invited talk)

18th Annual Meeting of the Tissue Culture Association, Philadelphia, Pa., June 4-7:

"Studies of Surface Glycopeptides of Cells in Suspension Culture" by P.M. Kraemer, H-4.

66th Annual Meeting of the Medical Library Association, Miami, Fla., June 11-15:

"Current Journal Routing" by Gretchen R. Riese, D-2.

13th Annual Meeting, American Nuclear Society, San Diego, Calif., June 11-15:

"Behavior of Long-Lived Fission Products in Sodium" by J. C. Clifford, K-2.

"Fourier Series Solution to Infinite Cylinder Problems" by W. L. Hendry, T-DOT.

"The Solubilities of Selected Group V Elements in Liquid Plutonium" by D. F. Bowersox and J. A. Leary, both CMB-11.

"Detailed Analysis of a Plutonium-Fueled Capsule by Gamma Scanning" by D. M. Holm and W. M. Sanders, both K-1.

"Phase Relations in the High-Carbon Portion of the U-Pu-C System" by J. G. Reavis, M. W. Shupe, C. W. Bjorklund and J. A. Leary, all CMB-11.

"^{233}U Cross Sections as Determined Using Neutrons from a Nuclear Detonation" by D. W. Bergen, W-8.

Symposium on Radiation Dose Measurements, European Nuclear Energy Agency, Stockholm, Sweden, June 12-16:

"Personal Air Sampling and Multiple Stage Sampling; Interpretation of Results from Personal and Static Air Samplers" by H. F. Schulte, H-5.

International Congress of Heterocyclic Chemistry, University of New Mexico, Albuquerque, N.M., June 12-15:

"Liquid Scintillators. The Synthesis and Properties of Some Dibenzo- and Dinaptho-Dioxepins, Dioxocins, Dioxonins, and Dioxecines" by J. E. Simpson and G. H. Daub, University of New Mexico, F. N. Hayes, H-4, and J. Yguerabide, Sandia Corporation.

"Synthesis of Some Picrylamino- and Nitro-Substituted Furazans" by M. D. Coburn, GMX-2.

Conjugate Point International Symposium, Boulder, Colo., June 13-16:

"The Conjugacy of Optical Auroras" by A. E. Belon, Geophysical Institute, University of Alaska; N.W. Glass, J-16; and K. B. Mather, Geophysical Institute, University of Alaska.

Health Physics Society Meeting, Washington, D.C., June 18-22:

"A Modified-Sphere Neutron Detector" by D. E. Hankins, H-1.

"A Study of the Day to Day Variation Associated with Human Plutonium Urinary Excretion" by W. D. Moss, E. E. Campbell, and H. F. Schulte, all H-5.

Refresher Course: "In-Plant Air Sampling" by H. F. Schulte, H-5.

116th Annual Convention of the American Medical Association, Atlantic City, N. J., June 18-22:

"Radiobiological Considerations in Manned Space Flight" by W. H. Langham, H-4.

Gordon Conference on Nucleic Acids, New Hampton, N.H., June 19-23:

"Summary of General Synthetic Program at Los Alamos" by F. N. Hayes, H-4. (Invited talk)

Gordon Research Conference on Nuclear Chemistry, New Hampton, N.H., June 19-23:

"Nuclear Reaction Spectroscopy in Deformed Nuclei" by Frank A. Rickey, Jr., P-DOR (Invited talk)

10th International Conference on Cosmic Rays, Calgary, Alberta, Canada, June 19-26:

"Attenuation of Neutron Monitor Radiation at Aircraft Altitudes" by H. Carmichael, Deep River Laboratory, AECL, Chalk River, Ontario; R. W. Peterson, J-16; and

M. A. Shea, Air Force Cambridge Research Laboratory, Bedford, Mass.

Symposium on Physics and Chemistry of the Upper Atmosphere, Pittsburgh, Pa., June 19-20:

"Reactions of He^+ with N_2 and O_2 in the Upper Atmosphere" by William B. Maier, II, J-10.

"Electron Excitation of Some Nitrogen Molecular Bands" by Redus F. Holland, J-10.

Eighth Carbon Conference, Buffalo, N.Y., June 19-23:

"A Method for Determining the Microstructural Changes in Graphite that Accompany High-Temperature Deformation" by W. V. Green, L. S. Levinson, R. D. Reiswig and E. G. Zukas, all CMF-13.

"Time Laws for Creep and Recovery in Graphite" by W. V. Green and E. G. Zukas both CMF-13.

"The High Temperature Creep Behavior of a Heavily-Oriented Graphite" by E. G. Zukas and W. V. Green, both CMF-13.

"Relaxation of Tensile Stress in a Reactor Graphite at 2000° C to 2700° C" by M. C. Smith, CMF-13.

"Observations on the Temperature Dependence of Young's Modulus of Graphites" by P. E. Armstrong, CMF-13.

"Methods for Estimating Statistics Descriptive of Graphite Powder Mixtures with Some Illustrations of Practical Applications" by H. D. Lewis, CMF-13.

"Observations Concerning the Determination of Porosity in Graphites" by J. M. Dickinson, CMF-13.

"Application of the Sarci System to the Graphite Research Program at the Los Alamos Scientific Laboratory" by Paul Wagner, CMF-13.

"The Thermal Conductivity of SX-5, A Fine-Grain Commercial Graphite" by Paul Wagner and L. B. Davelsberg, both CMF-13.

"The Determination of the Molecular Distribution of Graphite Binder Materials by Gel Permeation Chromatography" by E. M. Wewerka, CMF-13.

"Optical and Electron Microscopy of Carbonaceous Materials" by R. D. Reiswig, L. S. Levinson and T. D. Baker, all CMF-13.

Presentation at Summer Institute at the University of Minnesota, Minneapolis, Minn., June 21-23:

Four lectures: "Force Constants" by Llewellyn H. Jones, CMF-4.

American Physical Society Meeting, Toronto, Ontario, June 21-23:

"Cooperative Light Scattering from Theta-Pinch Plasmas" by Mark Daehler and F. L. Ribe, both P-15.

"Lattice Vibrations in Bismuth" by D. B. Smith, J. L. Warren and J. L. Yarnell, all P-2.

"High Voltage Vacuum Spark Switch" by A. H. Williams, R. M. Henson and J. W. Mather, all P-7.

"Current Sheath Resistance Measurements and a Dynamical Study of the Dense Plasma Focus" by P. J. Bottoms, R. M. Henson and J. W. Mather, all P-7.

"The Effect of Ground and Excited State Nuclear Deformations on Dipole Transition Rates in Closed Shell Nuclei" by G. E. Walker, T-9.

"Whole Body NMR Spectrometer" by J. A. Jackson, P-DOR and W. H. Langham, H-4.

International Symposium on Fluctuations and Diffusion in Plasmas, Princeton, N.J., June 26-30:

"Short-Wavelength Density Fluctuations in Theta-Pinch Plasmas" by Fred L. Ribe and Mark Daehler, P-15.

Symposium on Light Nuclei, Few Body Problems and Nuclear Forces, Brela, Yugoslavia, June 26-July 5:

"P-P Scattering at the Interference Minimum and Applications of the Absolute Velocity Gauge Technique" by John D. Seagrave, P-DOR.

"On the n-D Scattering Lengths and the S-Wave Phase Shifts" by John D. Seagrave, P-DOR and W. T. H. van Oers, University of California--Los Angeles.

"Sources of Polarized Neutrons" by John D. Seagrave, P-DOR.

"Elastic Scattering of Fast Neutrons by Liquid Hydrogen, Deuterium, Tritium and by He^3" by John D. Seagrave, P-DOR (Invited talk)

"Uncertainties in the Anisotropy of Low-Energy $^1H(n, n)$ Scattering" by John C. Hopkins, P-DOR.

American Society of Testing and Materials Symposium on Nondestructive Testing as Applied to Nuclear Graphite, Boston, Mass., June 27:

"Developments in the Nondestructive Testing of Graphite at the Los Alamos Scientific Laboratory" by B. L. Blanks, N. B. Edenborough, D. E. Elliott, and R. M. Ford, all GMX-1.

Colloquium at Lawrence Radiation Laboratory, Livermore, Calif., June 29:

"Time-of-flight Neutron Cross Section Measurements Using Nuclear Explosions" by Wilbur K. Brown, P-3.

Ten Site Now 'Open'

Ten Site, the headquarters for K Division, has joined the list of "open areas" within the Los Alamos Scientific Laboratory.

Willie Ortiz, alternate group leader of D-4, said Ten Site was opened April 28. No classified work is performed there, and security badges are no longer required for entry. However, like other open areas at LASL, the casual tourist or visitor is not permitted, and prior approval must be obtained for visits.

12 LASL Employes Retire In June

Twelve more names were added to LASL's growing list of retirees during June.

Lee Shlaer, a part-time secretary in GMX-11, retired June 1. She started work with LASL in March, 1959, as a secretary on a casual basis. She and her husband, Simon, a staff member in H-1, have been Los Alamos residents since 1947.

Beverley D. Clark, P-9 accelerator specialist, retired June 3 after 17 years with LASL. Clark joined the Laboratory as a control room operator with group W-3 in September, 1950, coming here from the sound recording department of Paramount studios in Hollywood. He transferred to P-16 in 1958, and while in that group was awarded a Certificate of Merit by the American Red Cross in recognition of his efforts in saving the life of a fellow worker suffering from severe electric shock. In 1964 Clark joined P-9 as a Van de Graaff specialist. He and his wife, Clarice, who is a teacher at Canyon School, will continue to live in Los Alamos.

Theodore J. Brousseau, SD-5 machinist, joined LASL in 1951 in SD-1 and transferred to SD-5 in November, 1959. He retired June 16. Prior to coming to Los Alamos, he spent most of his life on the East Coast, and calls Central Falls, R.I., his home town. He and his wife, Mary, will continue to live in Los Alamos. A son, Armand, works in group P-15.

Joseph M. Allen, Sr., GMX-3 instrument systems technician, retired June 16. He joined LASL in February, 1950, as a maintenance mechanic, after working with the Zia Co. here from 1946 to January, 1950. Before that, he worked at the Miami Army Air Field, Fla., as a metalsmith. He was born in Huntington, W.Va., and attended school in Florida. He and his family are now vacationing in Arizona.

The following people retired on June 30:

Elmer R. Bowen, SD-1 maintenance mechanic, came to LASL in August, 1943, to work in the Shops Department and is one of the longest-term employes in that department. He was in charge of the shops foundry for 18 years. A native Coloradoan, he was born in Pueblo and came to Los Alamos from Las Vegas, N.M., where he worked for an auto dealer. He and his wife, Louise, who is a secretary in the Shops Department office, will stay in Los Alamos. They plan to do some traveling, and, said Bowen, "get out my rocking chair and do nothing for six months, and then start rocking."

Oliver Cole, GMX-3 machinist, came to the Laboratory in November, 1953, with SD-1, and transferred to GMX-3 several months later. He was born in Forest City, Mo., and came to Los Alamos from the U.S. Naval Yard in Vallejo, Calif. His wife, Grace, is group secretary in T-3. Future plans for Cole are indefinite, but he says as of now, he will remain in Los Alamos.

Stuart C. Crowley, SD-5 machinist, joined LASL in September, 1949, as an industrial toolmaker. Originally from Massachusetts, he and his wife, Elizabeth, plan to continue living on the Hill, and he says he will do "nothing particular—just make a hobby of resting."

Frederick C. Hutchinson, SP-6 balance repairman, came to LASL in September, 1956. He was born in Suffolk County, Mass., and learned his trade at Ainsworth and Sons, Denver. Immediately before coming here, he worked for Underwood Corp. in Phoenix, Ariz. After retirement, Hutchinson will work under a private contract with LASL in the same type of work he has been doing, and will continue to live here. Hutchinson's son, William, works in CMB-1.

Robbie L. Ross, SP-12 catalog room clerk, has been an employe of LASL for more than 19 years. Her husband, Leon, chief engineer of the utilities and engineering section of the Zia Co., is retiring also. They will move to Albuquerque to make their future home, where a son, Leon, Jr., an architect, lives. Future plans for Robbie? She says she will "just enjoy life."

Heri T. Schulze, P-1 electronic construction shop supervisor, plans to move to Chama, N.M., following his retirement. He came to LASL in 1943 from Highlands University, Las Vegas, N.M., where he taught pre-radar to Signal Corps students. Prior to that he was a maintenance electrician for the city and county of Denver. Schulze, while at LASL, has also worked in the sheet metal shop, and most recently has been carrying out maintenance and service on radiation instruments. He plans to be married in the near future.

Gilbert P. Smith joined the Laboratory in November, 1952, in group W-3, and he has been with that group continually as a firing site technician. He was born in Maiden Rock, Wisc., and served in the U.S. Navy on active duty for more than 20 years before coming here. Smith plans to move to the Hawaiian Islands to live after retiring.

Mirl D. South, CMB-AS Laboratory services inspector, came to LASL in July, 1949, and worked here until September, 1956, when he terminated. However, he returned to the Laboratory and was rehired in the same position in July, 1958, and has been with CMB-AS since. Although not a native of New Mexico, he has been living in the state since 1922. His future plans are indefinite, but he plans to stay in Los Alamos for the time being. His wife, Robbie, works at the TG&Y store in Los Alamos.

new hires

Accounting Department

Juan B. Maestas, Santa Cruz, N.M., AO-4

CMB Division

Grady Ray Rose, Albuquerque, N.M., CMB-3

D Division

Mariano Vigil, Espanola, N.M., D-2 (casual)

Ivan E. Worthington, Los Alamos, D-8

Engineering Department

Dennis K. Mingo, Los Alamos, ENG-3

Robert A. Wellnitz, Franklin Park, Ill., ENG-5 (rehire)

GMX Division

Isabel C. Smith, Espanola, GMX-4

Elizabeth C. Martin, Los Alamos, GMX-11

J Division

George Seth Innis, Jr., Austin, Texas, J-15

K Division

Edward A. Thaddeus, Jr., Colbert, Wash., K-4

MP Division

James D. Courtney, Los Alamos, MP-2

James R. Faulkner, Palo Alto, Calif., MP-AE

William J. Van Dyke, Houston, Texas, MP-AE

Bobby Frank Poe, Winnsboro, Texas, MP-3 (rehire)

James E. Stovall, Los Alamos, MP-4 (rehire)

Richard L. Rhorer, Albuquerque, MP-AE

N Division

James R. Worline, Albuquerque, N-1

Larry V. East, Sandia Base, N.M., N-6

Public Relations

Clo Loree, Santa Fe, PUB-1

P Division

George J. Berzins, East Lansing, Mich., P-2

Dwight R. Dixon, Provo, Utah, P-3

Larry Mitchell, Albuquerque, P-7

Robert G. Jarvis, Los Alamos, P-16

Darrell L. Call, Albuquerque, P-16

David J. Deck, Indian Head, Mo., P-4

Shops Department

Kay D. M. Plumlee, Espanola, SD-DO

Richard D. Scarberry, Washington, Pa., SD-1

Andrew Brode, Uniontown, Ohio, SD-1

Supply & Property

Susan Crabtree, Los Alamos, SP-12

T Division

Jennie Netuschil, Los Alamos, T-1

James W. Moore, Santa Fe, T-1

Karl J. Melendez, University Park, N.M., T-1

Ray Davenport, Wichita Falls, Texas, T-1

James L. Cook, Clovis, N.M., T-3

W Division

Nicholas Nicholson, New York, W-7

LASL Science Museum Hosts Record Number of Visitors

Clicking crickets, bouncing balls, bells, bangs and sirens—the sights and sounds of LASL Science Hall and Museum showed 24,131 people the work of Los Alamos Scientic Laboratory the first six months of 1967.

Pinnochio, Old Plastico, Jezebel, Silly Too, Kiwi, Stretch and many other exhibits have played to 5,639 more people from January to June this year than they did in the same period last year. Museum Manager Bob Brashear said the six-month total for 1966 was only 18,438, and at this rate the visitor count should reach close to 65,000 for 1967. The final count last year was 52,934.

The clicking cricket sounds are really made by radiation counters in the health exhibit. Pinnochio utilizes ping pong balls to show how fission chains grow and are controlled. Jezebel is one of the family of unclad—and sometimes unpredictable—experimental reactors. The bells and bangs come from Silly Too, an electrical device showing how LASL scientists make electro-magnetic bottles in trying to "can" the nuclear power of the sun.

Siren sounds come both from the little Kiwi electric train working at a model of the Nuclear Rocket Development Station and a spinning mirror which is part of an ultra fast camera developed at LASL.

Visitors from all 50 United States and nearly 50 countries have walked down the museum halls viewing pictures of wartime Los Alamos, Trinity Site where the first nuclear weapon in history was tested, and artifacts from the age of the early Indian people who lived on Pajarito Plateau—where LASL started life less than a quarter of a century ago.

Shops Employe William Lambert Dies At 57

William J. Lambert, SD-1 machinist, died May 16 in Los Alamos Medical Center after a long illness. Lambert had been with the Los Alamos Scientific Laboratory since January, 1954, when he joined SD-1 as a welder. Born Dec. 17, 1909, in Altoona, Pa., Lambert came to Los Alamos from Denver, Colo., where he had been employed by Fox Sheet Metal. He served in the African, Italian and South Pacific campaigns during World War II.

Survivors include his wife, Janet; a son, Richard, of Arvada, Colo.; three grandchildren; his parents, Mr. and Mrs. John Lambert, Altoona; five brothers and four sisters. Services were held May 19 at the Immaculate Heart of Mary church, Los Alamos, with burial in the National Cemetery of Santa Fe.

20 years ago in los alamos

Culled from the files of Los Alamos Times, July, 1947, by Robert Y. Porton

Carroll Tyler Becomes Area Manager

Carroll L. Tyler, United States Navy Captain (Ret.), took over the management of the Santa Fe Area Office, AEC, this week from Col. Herbert C. Gee. Tyler is a graduate of the U.S. Naval Academy at Annapolis. He has had assignments of various kinds in the naval service and, during the latter part of the war, was detailed as special assistant to Dr. Vannevar Bush, director of the Office of Scientific Research and Development. He comes to Los Alamos from the Naval Ordinance Plant at Macon, Ga., where he was the commanding officer.

Theft At Site Of A-Bomb Data Files

The theft of some secret files from Los Alamos in 1946 was revealed to the Senate by Chairman Bourke Hickenlooper of the Joint Congressional Atomic Commission. This theft, he said, occurred when the War Department was in charge of the atomic energy plant. Hickenlooper said his commission "has no reason to believe" that there have been any recent thefts of secret documents. He told the Senate that the documents stolen from Los Alamos have since been recovered. The theft was committed by two Army sergeants who had been detailed to the project.

A-Energy Jackpot In Privacy Of Own Home

Atomic energy has already been put to common use! It has been housed compactly! It is absolutely harmless in its small package! It is cheap! While scientists expend millions in research, while secrecy clothes atomic power development, while political brains are matched in world conferences to find a satisfactory method of atomic control for the world, a private industry, unconnected with atomic energy, has announced its discovery in gaudy colors on a package of its own merchandise. Hill shoppers found new packages of breakfast food in local supermarkets, and on colorful exteriors it was announced that boys and girls could now attain a genuine atomic bomb ring for the amazingly low price of 15 cents and one box top. A new genius may be in the field—if not in science, then certainly in advertising promotion.

Group Upped to Division

The Health Group of the Laboratory has been raised to the status of a division, led by Dr. Louis Hempelmann, formerly group leader. Wright Langham, formerly head of the biochemistry section of the health group, is alternate leader.

what's doing

OUTDOOR ASSOCIATION: No charge, *open to the public. Contact leader for information about specific hikes.* Meetings at High School Little Theater July 18 and Aug. 15, 7 p.m.

- Thursday, July 20, evening hike, Ed Kmetko, leader, 2-3173.
- Thursday, July 27, evening hike, Ken Ewing, leader, 8-4488.
- Saturday and Sunday, July 29-30, Willow Lake in the Crestones, Dibbon Hagar, leader, 2-6209.
- Saturday, Aug. 12, contact leader (Terry Gibbs, 8-4909) for information.

GEOLOGICAL FIELD TRIP: through the Jemez country, Sunday, Aug. 6. Co-sponsored by the New Mexico Geological Society and the Los Alamos Geological Society. The trip will start from Bernalillo at 9 a.m., go to Jemez Creek, cross over the Valle Grande, and end at the Y below Los Alamos. For more information call Terry Wallace, 672-3269.

DON JUAN PLAYHOUSE: Outdoor theater between Los Alamos and Santa Fe, near San Ildefonso Pueblo. Tickets at box office, at Decol's in Los Alamos and the Centerline Shop in Santa Fe. Curtain 9:15 p.m.

- Friday and Saturday, July 21 and 22—"Irma La Douce," musical comedy.
- Friday and Saturday, July 28 and 29—"Who's Afraid of Virginia Woolf," by Edward Albee.

SPORTS CAR CLUB del Valle Rio Grande: Concourse in conjunction with Los Alamos *County Fair, Aug. 26.*

SANTA FE THEATRE COMPANY, performing in the Greer Garson Theatre, Santa Fe. Premier season, June 14-Sept. 3. *Performance Wednesdays through Sundays.* For information call 982-6511.

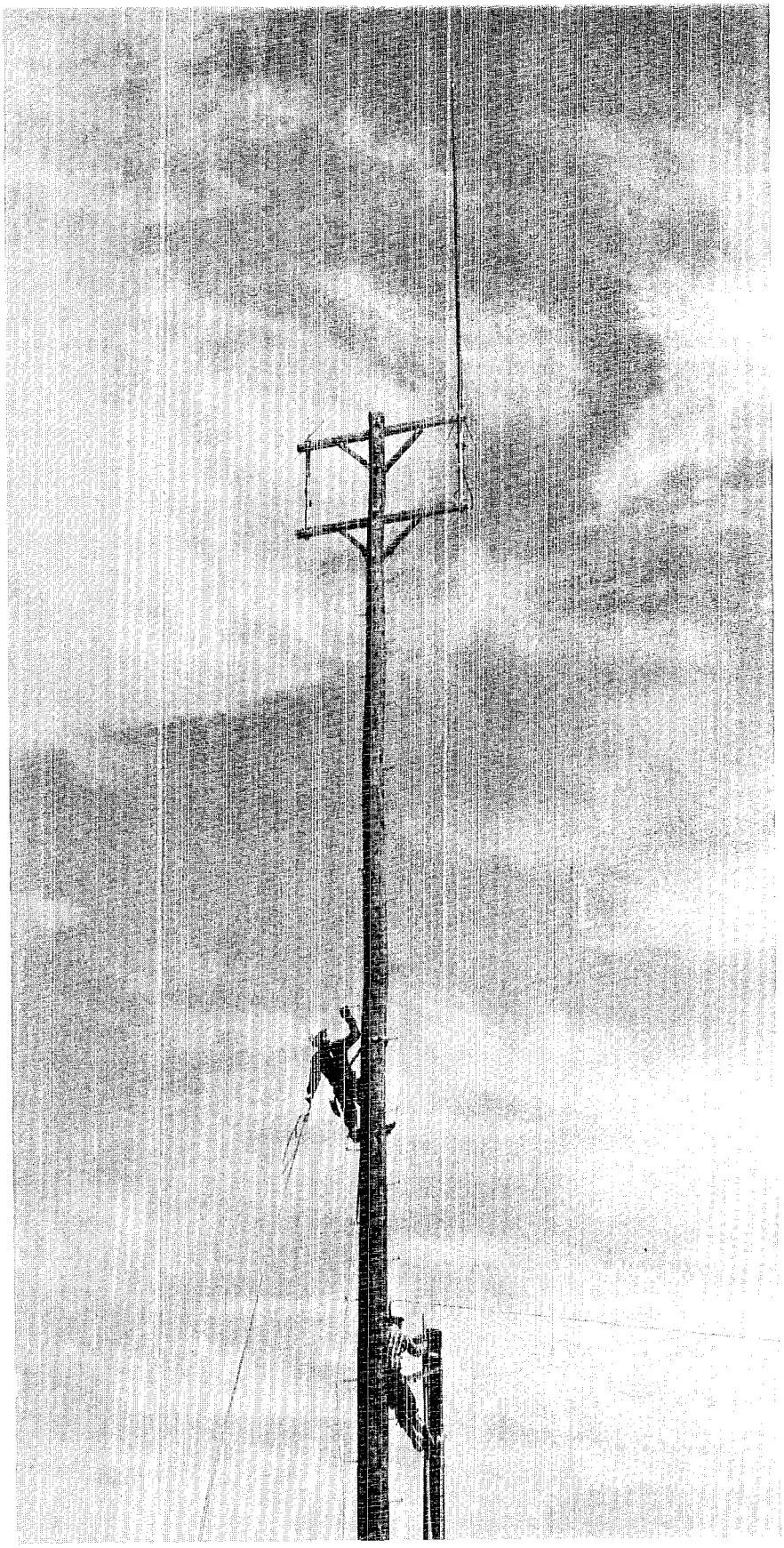
- July 12-23—"A View from the Bridge"
- July 26—Aug. 6—"LUV"
- Aug. 9-20—"The Subject was Roses"

SANTA FE OPERA: Tickets available at Los Alamos Building & Loan, Mondays, Wednesdays and Fridays from 10 a.m. to 1 p.m. *Curtain time 9 p.m.*

- Friday, July 21—Concert, University Concert Hall, Albuquerque
- Saturday, July 22—"La Boheme"
- Wednesday, July 26—"Cardillac," American Premiere
- Friday, July 28—"Cardillac"
- Saturday, July 29—"La Boheme"
- Wednesday, Aug. 2—"Boulevard Solitude," American Premiere
- Friday, Aug. 4—"Boulevard Solitude"
- Saturday, Aug. 5—"The Barber of Seville"
- Wednesday, Aug. 9—"Carmen"
- Friday, Aug. 11—"The Marriage of Figaro."

YOUTH OPERA LECTURES AND PERFORMANCES: Lectures open to the public, no charge, High School Little Theater, 7:30 p.m. Performances at the Opera Theater, 9 p.m., tickets available as Santa Fe Opera above.

- "Cardillac"—Lecture Sunday, July 23; performance Monday, July 24
- "Marriage of Figaro"—Lecture Monday, Aug. 7; performance Tuesday, Aug. 8.



An 80-foot-high antenna was recently installed on Pajarito Road for LASL's Engineering Department. The VHF-FM two-way base station facility will be used for trouble reporting, expediting calls and for coordination of other communications facilities in case of emergencies. The antenna will be used for communications from station to car, car to car and for portable units. Assisting in the installation were Joe Mascarenas, top, and Rudy Salazar, below, both lineman for Zia utilities and engineering.

BACK COVER:

Independence Day throughout the nation is a time for fireworks spectaculars, and Los Alamos is no exception. In fact, the topography of Los Alamos makes a fireworks display even more impressive as the sound echoes and rumbles through the canyons of town. The star-like lights in the foreground are flares in the detonation area, and at right is the KRSN radio tower. Barranca Mesa lights show in the distance.

(Photo by Bill Jack Rodgers)

Henry T. Motz
3187 Woodland
Los Alamos, New Mexico 87544